Sibling-Implemented Intervention for Improving Social Interaction Skills of Young Children who have Difficulties with Socialization

By

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CHAPTER 1

Overview: Investigation, Purpose, and Scope of Dissertation Research

Social integration and peer interactions are key elements for successful inclusion of young children with disabilities (Odom, 2002). Therefore, children with disabilities' development of social competence with peers become an important focus for early childhood special education (Guralnick, 1990; Odom, McConnell, & Chandler, 1993; Odom, McConnell, & McEvoy, 1992; Strain, 1990). Young children typically have a variety of learning opportunities to develop their social skills during their early years of life with their family members (Brown, Odom, & Conroy, 2001; Odom, McConnell, & Brown, 2008). In particular, young children's diverse social experiences with their siblings in their home and community can provide a rich context for learning important social skills including understanding the feelings of the others, initiating and sharing play and conversations, and how to compromise, negotiate, and join with peer groups, all of which are needed for successful social interactions with peers and friendships in later life (Guralnick & Neville, 1997; Janney & Snell, 2006; Merrell, Whitcomb, & Parisi, 2009; Odom, McConnell, & Brown, 2008; Odom, McConnell, & McEvoy, 1992).

Several research studies (e.g., Lobato & Tlaker, 1985; Powell, Salzberg, Rule, Levy, & Itzkowitz, 1983; Tekin & Kircaali-Iftar, 2002; Trent, Kaiser, & Wolery, 2005; Tsao & Odom, 2006) provided supports for the concept that siblings can play important roles for their siblings with disabilities' learning of age-appropriate social skills. Furthermore, a number of research studies (e.g., DiSalvo & Oswald, 2002; Goldstein, Kaczmarek, Pennington, & Shafer, 1992; Gonzalez-Lopez & Kamps, 1997; Kamps et al., 1992; Kamps, Potucek, Lopez, Kravits, & Kemmerer, 1997; Kohler, Strain, Maretsky, & DeCesare, 1990; Laushey & Heflin, 2000; Lefebvre & Strain, 1989; Odom, Hoyson, Jamieson, & Strain 1985; Odom & Strain, 1986;

Odom & Watts, 1991; Zanolli, Daggett, & Adams, 1996) have provided the evidence base to support the effectiveness of peer-implemented intervention for enhancing social skills of children with disabilities, particularly, children with autism. In these studies, the peers were taught specific social skills and strategies to support their initiation and response to children with disabilities. This literature could be thus added to the promising literature on siblings' role in supporting children with disability's learning to make a strong case for the likelihood that siblings would be successful intervention agents if they are systematically taught appropriate social skills and strategies.

The purpose of this dissertation research thus is to investigate this very question. That is, if provided with systematic and appropriate instructional strategies, can siblings serve as successful intervention agents for their sibling with a disability? To address this purpose, the dissertation document is presented in three sections. First, a research synthesis assessing the available research evidence on the effectiveness of siblings' role as intervention agents to improve young children with disabilities' age-appropriate social skills is presented to understand the need and specific focus for additional research. Second, a single-subject design study was conducted and the outcomes are reported in order to assess whether siblings when provided with systematic and appropriate instructional strategies can serve as successful intervention agents for their sibling with a disability's improving social interaction skills. The final section provides a practitioner focused description of the intervention. That is, a description of how early childhood teachers and families of young children with disabilities can prepare for and implement the sibling-implemented social interaction intervention.

Review of the Literature

The literature review, presented in chapter 2, provided an overview of the research and professional literature on the effectiveness of siblings' roles as intervention agents for improving their siblings with disabilities' age-appropriate skills. The review begins with the importance of siblings' roles for developing young children with disabilities' age-appropriate skills in their natural environments and the current evidence available on the effectiveness of peer-mediated interventions that supports siblings' potential role as effective intervention agents. Next, a process of searching for appropriate research literature spanning from 1975 to 2008 and the result of the search process, that is, the research studies that met the inclusion criteria are described. Finally, for each of the resulting studies key characteristics and outcomes of the research are identified and then synthesized across the set of studies. Key characteristics and outcomes include (a) experimental design and participants, (b) intervention features, (c) measurement procedures, and (d) research findings. Based upon the conclusions drawn from the set of studies, implications for future research are discussed including the need for conducting additional efficacy research.

Research Study

A single-subject multiple baseline design across the participants was developed and implemented in order to extend the research on sibling-implemented intervention, particularly, for improving young children with disabilities' social interaction skills. Within this investigation, behaviors of siblings were examined to determine if siblings can learn and use some specific social skills and strategies in interacting with their siblings with disabilities during play. Furthermore, behaviors of children with disabilities were examined to determine whether siblings' use of the social skills and strategies in interacting with their siblings with disabilities

resulted in changes in their play engagement and social interaction with their sibling. Findings indicate that the siblings can play an important role for improving their siblings with disabilities' social interaction skills by learning social skills and strategies and applying them to help play interactions with their siblings with disabilities. This investigation is thoroughly discussed in chapter 3 including methods, setting, experimental design and procedures, measurement, results, limitations, and implications.

Research to Practice

Finally, in chapter 4, a description of how the practitioners can apply the intervention strategies and procedures is provided using the information gained from the literature review and the findings of the research study. The purpose of the final chapter is to provide a practical and user-friendly description of the procedures, strategies, and techniques for implementing a sibling-implemented social interaction intervention to facilitate young children with disabilities' play engagement. Thus, practitioners such as early childhood special teachers and family members can after reading the chapter apply the intervention with their typically developing children in their natural environment.

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CHAPTER 2

Siblings as Potentially Important Agents for Developing Age-Appropriate Skills of Young Children with Disabilities: A Literature Review

Abstract

The research synthesis presented here reviewed the currently available evidence on the effectiveness of sibling-implemented interventions for their siblings with disabilities. The search for appropriate research literature spanned from 1975 to 2008 and resulted in a total of eight studies that met the inclusion criteria. All eight studies in this synthesis employed single-case design as the primary research methodology. The analysis of the eight studies is summarized into (a) experimental design and participants, (b) intervention features, (c) measurement procedures, and (d) findings. Taken together the outcomes of this research synthesis provide support for the effectiveness of sibling-implemented intervention for children with disabilities. Furthermore, implications for future research are discussed including taking into account specific siblings' characteristics (e.g., socialization, intellectual ability) and ensuring that future studies sufficiently address generalization and maintenance of intervention effect, and collect rigorous data on implementation fidelity.

Chapter 2

Siblings as Potentially Important Agents for Developing Age-Appropriate Skills of Young Children with Disabilities: A Literature Review

Young children spend large proportions of their days in the ongoing routines and contexts of their family (Downey & Condron, 2004; Stoneman, 2005; Tsao & Odom, 2006). Children develop important skills including communication and social skills as they interact with and imitate their families in their daily routines (Baker, 2000; Hancock & Kaiser, 1996; Miller & Cantwell, 1976; Swenson-Pierce, Kohl, & Egel, 1987). Particularly, siblings as play partners and models can serve important roles in supporting the child in achieving these important skills (Baker, 2000; James & Egel, 1986). These early learning experiences with siblings can play a foundational role for children's future school life and particularly in their future peer relationships (Baker, 2000; James & Egel, 1986; Jones & Schwartz, 2004; Powell, Salzberg, Rule, Levy, & Itzkowitz, 1983). Development of age-appropriate skills through interaction and play with siblings, in fact, has been shown to foster later academic achievement as well as successful social life (Baker, 2000; Knott, Lewis, & Williams, 2007; Powell et al., 1983).

Children with disabilities, however, may benefit less from these natural learning opportunities because of developmental skill delays, behavioral problems, and lack of social competence (Knott, Lewis, & Williams, 2007; Strain & Danko, 1995; Tsao & Odom, 2006). These same issues can impede their relationships and interactions with their siblings (Downey & Condron, 2004; Knott et al., 2007; Stoneman, 2005). Siblings may feel frustrated by failures to interact or sustain interactions with their siblings with disabilities (Knott et al., 2007; Stoneman, 2005). As a result, both children with disabilities and their siblings may experience limited positive daily learning opportunities even though they spend much time together in their family

contexts. Therefore, siblings may need to learn how to support their siblings with disabilities. Furthermore, given the siblings' important role as a social, play, and learning partner, the sibling has the potential to serve as an intervention agent for supporting skill developments for their siblings with disabilities (Lobato & Tlaker, 1985; Powell, Salzberg, Rule, Levy, & Itzkowitz, 1983). However, in order to be a successful intervention agent, the siblings would need to be systematically taught appropriate support strategies.

A large body of research has been reported on the effectiveness of peer–implemented interventions for promoting social skills of children with disabilities, particularly children with autism (e.g., DiSalvo & Oswald, 2002; Goldstein et al., 1992; Gonzalez-Lopez & Kamps, 1997; Kamps et al., 1997; Kohler et al., 1990; Laushey & Heflin, 2000; Lefebvre & Strain, 1989; Odom et al., 1985; Odom & Strain, 1986; Odom & Watts, 1991; Zanolli, Daggett, & Adams, 1996). These studies used peers as powerful agents for enhancing social interaction skills of children with disabilities. Specific strategies were taught to the peers to support their initiation of and sustaining interaction with children with disabilities. The children with disabilities were simultaneously provided instruction in how to respond to peer initiations. All of these studies reported substantial improvements in social interaction skills of children with disabilities thus supporting the conclusion that peer-implemented interventions are an evidence-based practice (Odom, Brown, Frey, Karasu, Smith-Canter, & Strain, 2003). Given our knowledge of the important role siblings play in social skills development together with the evidence for the effectiveness of peer-implemented intervention one could regard siblings as important potential intervention agents. Therefore, studies to date addressing sibling-implemented interventions need to be reviewed in order to understand if in fact siblings can serve as effective intervention agents.

The purpose of this research synthesis is to review the currently available evidence on the effectiveness of sibling-implemented interventions in which the sibling serves as the intervention agent for teaching age appropriate skills to their siblings with disabilities. All of the sibling-implemented intervention research studies in this synthesis employed single-case design as their primary research methodology although this was neither an inclusion criteria nor the specific intent of the authors. Therefore, the standards of evidence for single subject research suggested by Horner and his colleagues (2005) are used to assess the quality of this set of studies and to answer the question as to whether one can consider sibling based interventions to be an evidence based practice. Horner and his colleagues identified the following seven quality indicator categories: (a) description of participants and settings, (b) dependent variable, (c) independent variable, (d) baseline, (e) experimental control/internal validity, (f) external validity, and (g) social validity. The primary question to be answered by this review thus is whether or not the currently available research provides sufficient evidence for considering sibling-implemented interventions as an evidence-based practice according to Horner and colleagues' quality indicators. In addition, the following questions will be addressed to more fully understand the research literature: (a) What are the characteristics (e.g., age, socialization, intellectual ability) of the sibling participants? (b) What are the behaviors or skills targeted for intervention for the children with disabilities? and (c) Is 'implementation fidelity' assessed and if so how?

Method for Identifying Studies

Search Procedures

Identification of published research studies was accomplished through a two-step procedure: (a) computer searches and (b) hand searches. First, a computer-assisted bibliographic search was conducted with keywords (i.e., siblings, sisters and brothers, sibling involved

intervention, sibling implemented, sibling intervention, children with disabilities, young child, sibling as therapist, sibling as teacher, sibling as intervention agent) in appropriate combinations. Computer searches were conducted using (a) Educational Resources Information Center (ERIC), (b) PsychINFO, (c) Expanded Academic ASAP, (d) Kluwer Journals Online, (e) Wilson OmniFile Full Text Select, (f) Academic search premier, and (g) ProQuest dissertations and these databases. A total of 18 journal articles, documents, and dissertations published between the years 1975 and 2008 (June) were identified through this process.

Second, a hand search was conducted of major journals which would serve as appropriate outlets for research on this topic (e.g., Journal of Early Intervention, Topics in Early Childhood Special Education, Journal of Applied Behavior Analysis, Exceptional Children) covering the years 2005 through 2008 (June). In addition, reference sections from previously identified research articles and research review articles (e.g., Hancock & Kaiser, 1996; James & Egel, 1986; Schreibman, O'Neill, & Koegel, 1983) and books (e.g., Gallagher, Powell, & Rhodes, 2006; Miller & Miller, 1976) that were related to the topic were examined to identify additional research studies that were not captured through computer searches. Four additional studies were identified through this hand search procedure. Thus, a total of 22 published research studies were identified through these two procedures.

Inclusion Criteria

The 22 identified studies were then reviewed by the first and second authors, independently, to determine if they met the following inclusion criteria: (a) published in a peer-review journal, (b) include at least one typically developing sibling serving as a primary intervention agent, (c) the target children must have an identified disability, (d) include a complete description of the intervention procedures, (e) include at least one outcome measure

related to the sibling(s), and (f) include a measure of the impact of sibling-implemented intervention on the child with a disability. The two authors then meet to develop the final list of studies for inclusion.

Seven studies of the 22 identified (i.e., Adams, 1999; Hetzke, 2004; Miller & Miller, 1976; Sullivan, 1999; Tekin & Kircaali-Iftar, 2002) were not included in this process because they were not published peer-reviewed journals. Three more studies (i.e., Baker, 2000; Bass & Mulick, 2007; Powell, Salzberg, Rule, Levy, & Itzkowitz, 1983) were excluded because typically developing siblings were not primary intervention agents although siblings participated in these studies. Four studies (i.e., Cash & Evans, 1975; Jones & Schwartz, 2004; Lobato & Tlaker, 1985; Miller & Cantwell, 1976) were also excluded because they did not have outcome measure related to the siblings. Therefore, a final total of eight articles (i.e., Celiberti & Harris, 1993; Colletti & Harris, 1977; Hancock & Kaiser, 1996; James & Egel, 1986; Schreibman, O'Neill, & Koegel, 1983; Swenson-Pierce, Kohl, & Egel, 1987; Tsao & Odom, 2006; Trent, Kaiser, & Wolery, 2005) from the original 22 meeting the inclusion criteria were selected for inclusion in the synthesis. All eight studies of sibling implemented interventions in this synthesis employed single-case design as the primary research methodology.

Resulting Studies

A descriptive summary of sibling-implemented interventions of the eight research studies is provided first. The summary is organized into the following sections: (a) experimental design and participants, (b) measurement procedures, (c) intervention features, and (d) findings. Each section is described with a table to provide specific information of each study.

Experimental Design and Participants

Table 1 provides a brief summary of the design and participants characteristics for each of the eight studies. As noted earlier, all eight studies employed some type of single-case design. Seven of the eight studies used multiple baseline design across sibling pairs. Among the seven studies, two studies (i.e., Celiberti & Harris, 1993; Trent, Kaiser, & Wolery, 2005) used a multiple baseline design across skills or behaviors as well as sibling pairs. One study (i.e., Colletti & Harris, 1977) employed a reversal (withdrawal) design.

Participant demographic information provided in table 1 includes the age and gender of each participant and the diagnosis of each target child. The average age of the siblings was 9 years ranging from 5 years to 13 years. The average age of the target children (i.e., children with disabilities) was 6 years (Range 3 years to 10 years). Generally, the children with disabilities were reported as younger than the sibling serving as the intervention agent. Specifically, in seven of the eight studies all of the siblings were older than their target child. One study (i.e., Tsao & Odom, 2006), however, did report that in two of their four sibling dyads the siblings were younger than the target children with disabilities.

Seventy one percent (17/24) of the siblings were female and 29% (7/24) male while 39% of the target children (9/23) were female and 61% were male (14/23). Thus we see that for this set of studies females more frequently served in the role as interventionists while the target children tended to more frequently be male. Nearly half (11/23) of the target children had a diagnosis of autism, followed by 17 % (2/23) with a diagnosis of mental retardation, 13% (3/23) cerebral palsy, and 9% (2/23) Down syndrome. In addition, one child had a diagnosis of severe neurological impairment, one a diagnosis of developmental delay, and a third William's syndrome. All eight studies occurred within the home environment of the sibling dyads.

Measurement Procedures

Table 2 provides a brief summary for each study of measurement procedures including (a) primary data collection, (b) data collection of maintenance and generalization, (c) reliability assessment, and (d) social validity.

Primary data collection. All eight studies used observational coding methods as the primary form of data collection for assessing the impact of the intervention on sibling and children with disabilities. Specifically, four of the eight studies (i.e., Celiberti & Harris, 1993; James & Egel, 1986; Trent, Kaiser, & Wolery, 2005; Tsao & Odom, 2006) reported that they used video-recordings of sessions for collection and subsequent coding while the remaining studies used direct observation coding with audio-recording for coding the data. Six of the eight studies (i.e., Celiberti & Harris, 1993; Colletti & Harris, 1977; James & Egel, 1986; Schreibman, O'Neill, & Koegel, 1983; Trent, Kaiser, & Wolery, 2005; Tsao & Odom, 2006) reported that the researchers used partial interval recording system. Specifically, five studies (i.e., Celiberti & Harris, 1993; Colletti & Harris, 1977; James & Egel, 1986; Trent, Kaiser, & Wolery, 2005; Tsao & Odom, 2006) reported that they used 10 s interval recording system. The final study (i.e., Schreibman, O'Neill, & Koegel, 1983) reported that they used 30 s interval recording system.

Maintenance assessment. Seven of the eight studies (i.e., Celiberti & Harris, 1993; Colletti & Harris, 1977; Hancock & Kaiser, 1996; James & Egel, 1986; Swenson-Pierce, Kohl, & Egel, 1987; Trent, Kaiser, & Wolery, 2005; Tsao & Odom, 2006) assessed maintenance of treatment effects. These seven studies assessed the maintenance over periods ranging from a few weeks to six months. Five of the studies (i.e., Celiberti & Harris, 1993; Colletti & Harris, 1977; Hancock & Kaiser, 1996; Trent, Kaiser, & Wolery, 2005; Tsao & Odom, 2006) reported that they collected the average of 13 min data (range from 10 to 20 min) for each session. Three

studies (i.e., Colletti & Harris, 1977; James & Egel, 1986; Swenson-Pierce, Kohl, & Egel, 1987) reported total number of maintenance probes ranging from a total of three to a total of ten.

Generalization assessment. Six of the eight studies (i.e., Celiberti & Harris, 1993; Hancock & Kaiser, 1996; James & Egel, 1986; Schreibman, O'Neill, & Koegel, 1983; Swenson-Pierce, Kohl, & Egel, 1987; Tsao & Odom, 2006) reported the generalization of treatment effects. Two studies (i.e., Schreibman, O'Neill, & Koegel, 1983; Tsao & Odom, 2006) assessed generalization across settings such as children's community and research center and two other studies (i.e., Celiberti & Harris, 1993; Swenson-Pierce, Kohl, & Egel, 1987) assessed with novel toys and tasks. Another study (i.e., Hancock & Kaiser, 1996) assessed generalization across time and the final study (i.e., James & Egel, 1986) assessed across participants that were peers. The timing of the generalization probes varied across the six studies: two studies (i.e., Celiberti and Harris, 1993; Hancock and Kaiser, 1996) probing during baseline, intervention, and follow-up; three studies (i.e., James and Egel, 1986; Schreibman, O'Neill, & Koegel, 1983; Swenson-Pierce, Kohl, & Egel, 1987) probing during baseline and intervention; and one study (i.e., Tsao & Odom, 2006) probing simply during intervention sessions. Three studies (i.e., Celiberti and Harris, 1993; Hancock and Kaiser, 1996; Swenson-Pierce, Kohl, & Egel, 1987) reported total number of generalization probes that are varied across the studies from a total of three to a total of six.

Reliability. All eight studies reported information regarding inter-observer agreement or reliability. Seven of the eight studies [Colletti & Harris (1977) did not] reported the percentage of observation sessions for which inter-observer agreement was collected. The average percentage of inter-observer agreement or reliability sessions was 36% of all sessions (range 20% to 61%). Inter-observer agreement or reliability scores of the targeted behaviors ranged from 77.7% to 99%, with the mean percentage of 95%.

Social validation. Five of the eight studies (i.e., Celiberti & Harris, 1993; James & Egel, 1986; Schreibman, O'Neill, & Koegel, 1983; Swenson-Pierce, Kohl, & Egel, 1987; Tsao & Odom, 2006) reported the use of a social validity assessment process to assess the social importance of the intervention effects. Two studies (i.e., Celiberti & Harris, 1993; Tsao & Odom, 2006) used one- or two-minute segments videotape that were randomly selected and order which were than coded by "naïve raters". Celiberti and Harris used the Social Validation Rating Scale to have the raters rate for affective factors of siblings, sibling behaviors, the degree to which the interaction was beneficial to the target child, and target child's behaviors. Tsao and Odom also used a rating scale to have the raters indicate whether the target children had fun and were involved in social play as well as assessing the quality of the interaction between children.

Three of the studies (i.e., James & Egel, 1986; Schreibman, O'Neill, & Koegel, 1983; Swenson-Pierce, Kohl, & Egel, 1987) used a parent questionnaire for assessing social validity. Swenson-Pierce, Kohl, and Egel provided a questionnaire to the siblings as well. The questionnaires asked the respondents to indicate the extent of change in target behaviors of siblings, their perception of how difficult it was for the children to learn the behaviors, the benefits of the program to both of the children, and the usefulness of the training.

Intervention Features

Table 3 provides a brief summary for each study on the key intervention features including intervention procedures, siblings target behavior, and children with disabilities target behavior. Each of these intervention features is discussed in the following sections.

Intervention procedures. All eight studies reported that sibling training was provided and further occurred after the baseline sessions and during the first part of the intervention sessions. The length of the training was reported by amount of time and/or session for seven of

the eight studies with one study (i.e., Colletti & Harris, 1977) not reporting. The average length of sibling training for the seven studies was 22 minutes (range ten to 45 minutes). One study (i.e., James & Egel, 1986) reported the use of separate training for the siblings and for the target children.

The training procedures of the eight studies included demonstration or explanation of the targeted skills or strategies, discussion about the skills or strategies, role-playing with trainers and/or practicing with siblings, and providing feedbacks. Two studies (i.e., Hancock & Kaiser, 1996; Schreibman, O'Neill, & Koegel, 1983) reported the use of videotapes for presenting examples or modeling. Another study (i.e., Tsao & Odom, 2006) reported the use of a story for illustrating the use of the targeted skills during the training.

Siblings target behavior. Siblings were trained to acquire specific skills or behaviors in order to promoting their siblings with disabilities' target skills or behaviors. Two of the eight studies (i.e., James & Egel, 1986; Tsao & Odom, 2006) had social interaction strategies as sibling target behavior. Specifically, siblings' target behavior of the first study (i.e., James & Egel) was positive reciprocal interaction with their siblings with disabilities either in motor-gestural (e.g., sharing, assistance) or vocal-verbal ways (e.g., play organizer, statements). In the second study (i.e., Tsao & Odom), both positive and negative social initiation and social response and no social behavior were the target behaviors of the siblings. Three studies (i.e., Celiberti & Harris, 1993; Colletti & Harris, 1977; Schreibman, O'Neill, & Koegel, 1983) measured behavioral modification skills of the siblings as their target behavior. For example, specific skills for behavioral modification include the use of prompting, praising, shaping, consequences, discrete trials, and food reinforcement. One study (i.e., Hancock & Kaiser, 1996) taught the siblings milieu teaching skills (e.g., teaching episodes, consequation of verbal

responses of the target child) and turn taking with their siblings with disabilities. Another study (i.e., Trent, Kaiser, & Wolery, 2005) taught the siblings interactive communication strategies (e.g., mirroring, responding). The final study (i.e., Swenson-Pierce, Kohl, & Egel, 1987) measured siblings' use of instructional techniques (e.g., prompting, social praise) for improving domestic skills of the target children.

Children with disabilities' target behavior. To assess the impact on the target child of the sibling-implemented intervention, each of the eight studies identified specific skills or behaviors targeted for acquisition a change by the child with a disability. Two studies (i.e., James & Egel, 1986; Tsao & Odom, 2006) addressed reciprocal interaction with their siblings including initiation and response behaviors. Additionally, the second study included joint attention. Three studies (i.e., Celiberti & Harris, 1993; Colletti & Harris, 1977; Schreibman, O'Neill, & Koegel, 1983) targeted the display of correcting responding to their siblings' request of engagement in play or other types of activities. For example, in Colletti and Harris (1997) the child's active engagement in activities such as stringing beads and completing a work sheet while simultaneously decreasing out-of-seat behavior was targeted. Two studies (i.e., Hancock & Kaiser, 1996; Trent, Kaiser, & Wolery, 2005) targeted increasing use of specific language behaviors (e.g., increasing utterances, increasing prepositions, use of total vocalizations). Another study (i.e., Swenson-Pierce, Kohl, & Egel, 1987) targeted the acquisition of specific domestic skills (e.g., bed making, sack lunch preparation).

Findings

The findings are related to the outcomes of sibling-implemented intervention including the impact of the intervention, maintenance and generalization of effects, and the outcome of

social validity assessment for each study. Each of these aspects of the findings of the group of studies is addressed in the following sections.

Impact of intervention. Across all eight studies, the interventions were reported as positively impacting the target skills or behaviors for the majority of the siblings and children with disabilities. The rates of behavior change of the siblings' acquisition of the target skills or behaviors during the intervention phases were in most cases higher than those achieved by the target children. The acquisition rate for each of the siblings or target children varied across studies with some skills or behaviors clearly being easier to master. For instance, in the Celiberti and Harris (1993) study, siblings showed higher rates for praising (e.g., 0% → 90%, 9% → 70%) than for prompting (e.g., 31% → 67%, 13% → 53%) from baseline to intervention phases. In Swenson-Pierce, Kohl and Egel (1987) study, siblings one and three showed similar average rates for prompts and praise while sibling two had higher rates for prompts than for praise.

Two of the studies reported mixed results for changes in the sibling behavior. Specifically, in both studies (i.e., James & Egel, 1986; Tsao & Odom, 2006) one sibling exhibited a decrease in the target behavior(s) while the other siblings showed an increase. In the James and Egel (1986) study, two siblings were reported as showing an increase in all three of their target behaviors [(i.e., reciprocal interactions, initiations, responses) (e.g., 17% → 73%, 75% → 100%)] while the third sibling exhibited a slight decrease of in one of their target behaviors (i.e., responses, 100% → 84.1%) during the intervention phases. However, all three target children in this study (i.e., James & Engel) exhibited increases in both initiations and responses during the intervention phases. In Tsao and Odom (2006) study, one sibling did not increase the number of social behaviors directed towards their sibling with disabilities (i.e., 43.9% → 32.8%) while the other three siblings increased their socially directed behaviors (e.g., 6.5% → 16.8%, 3.6% →

13.1%) during the intervention phases. All of the target children in this study (i.e., Tsao & Odom) did, however, demonstrate increases in the number of social orienting and other targeted social behaviors during the intervention phases. This study reported that the increase of social orientation (e.g., rarely occurring stereotypic behavior, decrease of on-looking behavior) was primarily a function of increases of joint attention behavior by the children with disabilities.

Two of the group of eight studies (i.e., Hancock & Kaiser, 1996; Trent, Kaiser, & Wolery, 2005) reported mixed results for positive outcomes for the target child(ren). Hancock and Kaiser (1996) reported that one child with disability demonstrated such variability in his total use of utterances across all conditions that it was not possible to determine clearly a positive trend during the intervention phases. Trent, Kaiser, and Wolery (2005) reported that one of the target children did not increase verbal behaviors although another target child in the study increased social behaviors as a function of participating in the intervention.

Thus in summary, if taken together the eight studies reported that for the majority of siblings (i.e., 22 of the 24 total numbers of siblings) positive gains in targeted skills or behaviors were noted as a function of the intervention. Similarly, across the eight studies the majority of targeted children (i.e., 23 of the 24 total numbers of children with disabilities) demonstrated positive gains in targeted skills or behaviors across the intervention phases of the study.

Maintenance of effects. Seven of the eight studies (i.e., Celiberti & Harris, 1993; Colletti & Harris, 1977; Hancock & Kaiser, 1996; James & Egel, 1986; Swenson-Pierce, Kohl, & Egel, 1987; Trent, Kaiser, & Wolery, 2005; Tsao & Odom, 2006) reported that the positive effects on the targeted outcomes were maintained for at least some of sibling and children with disabilities dyads after the intervention phases. One of the eight studies (i.e., Schreibman, O'Neill, & Koegel, 1983), however, did not collect maintenance data. Of the seven reporting positive maintenance of

effects, however, two studies (i.e., Colletti & Harris, 1977; Swenson-Pierce, Kohl, & Egel, 1987) reported that one child with disability in each of their studies did not maintain the improvements of at least one of their target behaviors while the other target children maintained the improvements across all target behaviors. Specifically, in the Colletti and Harris (1977) study, one child increased his out-of seat behavior (i.e., 36%) during the follow-up phases although the child decreased the behavior (i.e., 0%) during the intervention phases. In the Swenson-Pierce, Kohl, and Egel (1987), one child did not maintain the high level of independent responding to their siblings [i.e., 0% (Baseline) → 38% (Intervention) → 26% (Maintenance)]. Also for two of the seven studies reporting some level of maintenance (i.e., Colletti & Harris, 1977; Tsao & Odom, 2006) it was noted that some of the children did not participate in the maintenance phase. Thus, in summary across the seven studies reporting maintenance data, positive maintenance effects were reported for 22 of the 23 total numbers of siblings and similarly for 15 of the 18 total numbers of target children.

Generalization of effects. Six of the eight studies reported collecting data to assess whether the targeted behaviors for both siblings and children with disabilities demonstrated generalization to other contexts (i.e., Celibertia & Harris, 1993; Hancock & Kaiser, 1996; James & Engel, 1986; Shreibman, O'Neill, & Koegel, 1983; Swenson-Pierce, Kohl, & Egel, 1987; Tsao & Odom, 2006).Three of these six studies (i.e., Celiberti & Harris, 1993; Shreibman, O'Neill, & Koegel, 1983; Swenson-Pierce, Kohl, & Egel, 1987) reported increased demonstration of the target behavior for both siblings and target children in the generalization condition. One of the six studies (i.e., James & Egel, 1986) reported that only two of the three sibling pairs were able to participate in the generalization condition but both of these sibling pairs did in fact demonstrate meaningful generalization to non-intervention conditions. Another study (i.e.,

Hancock & Kaiser, 1996) reported that one of the three sibling pairs demonstrated little generalization of behaviors while the other two sibling pairs showed some level of generalization of behaviors. The final of the six studies (i.e., Tsao & Odom, 2006) reported that the target children had difficulty playing with their siblings although the siblings did demonstrate increased social behaviors toward the target children in the generalization settings. In summary across the six studies reporting generalization data, positive generalization effects were reported for 16 of the 19 total numbers of siblings and similarly for 12 of the 16 total numbers of target children.

Social validation. As noted earlier, five studies (i.e., Celiberti & Harris, 1993; James & Egel, 1986; Schreibman, O'Neill, & Koegel, 1983; Swenson-Pierce, Kohl, & Egel, 1987; Tsao & Odom, 2006) reported conducting assessments to determine whether the treatment effects should be considered meaningful. Two studies (i.e., Celiberti & Harris, 1993; Tsao & Odom, 2006) used one or two min video segments to assess meaningful changes and reported that the means of intervention or after-intervention were significantly higher than the means of baseline. Three studies (i.e., James & Egel, 1986; Schreibman, O'Neill, & Koegel, 1983; Swenson-Pierce, Kohl, & Egel, 1987) that used a questionnaire to one or both parents reported that they believed that both siblings and target children showed more positive behaviors toward each other and thus overall had very positive feelings of having participated in the study. Furthermore, the three studies reported that the participants in responding to the survey reported that they enjoyed participating in the study.

Discussion

The purpose of this research synthesis was to review studies addressing sibling-implemented interventions to assess if siblings serve as effective intervention agents for teaching age appropriate skills to their siblings with disabilities. The primary research question was to

determine whether or not the reviewed studies support the intervention as an evidence-based practice. According to Horner and colleagues (2005), an intervention or practice which has been studied using single-subject methodology may be considered an evidence-based practice "when (a) a minimum of five studies meet acceptable methodological criteria (i.e., studies need to meet five of the seven categories, that is, description of participants and settings, dependent variable, independent variable, baseline, experimental control/internal validity, external validity, and social validity) and published in peer-reviewed journals, (b) studies are conducted by at least three different researchers across at least three different geographical locations, and (c) five or more studies include a total of at least 20 participants (p.176)."

As noted earlier, relatively few studies addressing sibling-implemented interventions (i.e., 22 studies) were found and of those only eight studies meet the inclusion criteria for our synthesis. These eight studies were then reviewed to assess whether or not they meet each of the seven categories of acceptable methodological quality. Of the eight studies five (i.e., Celiberti & Harris, 1993; James & Egel, 1986; Schreibman, O'Neill, & Koegel, 1983; Trent, Kaiser, & Wolery, 2005; Tsao & Odom, 2006) were coded as meeting the minimum of five of the seven acceptable methodological categories and all were published in peer-reviewed journals. All five studies also were conducted by at least three different researchers and located in more than three geographical locations. Finally, a total of 36 participants participated in these five studies, which is well over the minimum required number (i.e., 20) of participants noted by Horner and colleagues. Therefore, the response to our primary research question is yes. That is, the sibling-implemented intervention addressed in this synthesis can be considered an evidence-based practice.

In addition, we proposed to draw from the literature a more comprehensive understanding of sibling based intervention research by answering three additional questions. Thus in the next sections of the discussion the following questions are addressed to more fully understand the research literature: (1) What are the characteristics (e.g., age, socialization, intellectual ability) of the sibling participants? (2) what are the behaviors or skills targeted for intervention for the children with disabilities? and (3) is 'implementation fidelity' assessed and if so how?

What are the characteristics (e.g., age, socialization, intellectual ability) of the sibling participants? Overall, older female siblings frequently served as intervention agents in the studies of this research synthesis. Four studies (i.e., Hancock & Kaiser, 1996; Swenson-Pierce, Kohl, & Egel, 1987; Trent, Kaiser, & Wolery, 2005) specifically reported using siblings' age as an inclusion criteria for their participation with a requirement that they were older than their siblings with disabilities. Regarding social behavior and intellectual ability, three studies (i.e., Celiberti & Harris, 1993; Schreibman, O'Neill, & Koegel, 1983; Tsao & Odom, 2006) also noted "inclusion criteria" for siblings trainers of typical social development, normal intelligence, and successful adaptation to school. In addition to these characteristics, two studies (i.e., Hancock & Kaiser, 1996; Trent, Kaiser, & Wolery, 2005) reported that the importance of siblings being willing participants in their studies. And one study (i.e., Swenson-Pierce, Kohl, & Egel, 1987) reported the importance of the siblings having a minimum level of good rapports with their siblings with disabilities at the beginning of the study. These findings support the importance to consider the age, gender, social behavior competence, intellectual ability, and rapport of the siblings when implementing a sibling-implemented intervention.

What are the target behaviors or skills targeted for intervention for the children with disabilities? As noted earlier, three studies (i.e., Celiberti & Harris, 1993; Colletti & Harris,

1977; Schreibman, O'Neill, & Koegel, 1983) addressed behavior change or modification as target behaviors for the intervention. Two studies (i.e., James & Egel, 1986; Tsao & Odom, 2006) implemented the sibling-implemented intervention for improving the social behaviors of the children with disabilities. Another two studies (i.e., Hancock & Kaiser, 1996; Trent, Kaiser, & Wolery, 2005) conducted the sibling-implemented intervention to target language or communication behaviors of children with disabilities. The final study (i.e., Swenson-Pierce, Kohl, & Egel, 1987) addressed domestic living skills as target skills for the intervention. Thus the majority of studies focused on important functional skills that would support the child with a disability's active participation and particularly social interaction (i.e., social and communication) within natural environments.

Is 'implementation fidelity' assessed and if so how? Only two of the eight studies (i.e., Trent, Kaiser, & Wolery, 2005; Tsao & Odom, 2006) reported the collection of implementation fidelity. These two studies used a checklist to assess whether training was implemented with precision and consistency (Detrich, 1999). One of the two studies assessed implementation fidelity by the primary observer and the other by the parents of the participants. It should be noted that these two studies to represent the most recent studies assessed implementation fidelity, which is reflective of the changing emphasis placed on fidelity across most areas of intervention research.

Implications for Future Research

The outcomes of this synthesis lead directly to several implications for future research. First, the small size of the current literature indicates that additional research on sibling-implemented intervention is needed for supporting its effectiveness and confirming it as an evidence-based practice. Particularly, research studies on sibling-implemented intervention

targeting a variety of age-appropriate functional skills for young children with disabilities are needed to support the effectiveness of the intervention. Second, although the eight studies reported siblings' characteristics such as age and gender, very few studies reported on other characteristics including socialization and relationship with their siblings with disabilities. More specific description of siblings' characteristics may allow for a greater understanding of how these characteristics relate to the effectiveness of the sibling-implemented intervention. Third, the reviewed literature indicates that research needs to include sufficient information about generalization and maintenance in order to ensure that children can in fact use learned behaviors over time and across contexts and thus truly impact positively the child and family's quality of life. Finally, information regarding implementation fidelity is needed to ensure that the intervention is implemented as planned, to begin to investigate what in fact may be the critical active ingredients of the intervention, and to assess issues around feasibility of implementation in the real world of family's homes and lives.

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Table 1
Characteristics of Experimental Design and Participants

Study	Experimental design	Sibling(s)		Child(ren) with disabilities		
		Age	Gender	Age	Gender	Diagnosis
Celiberti& Harris (1993)	Multiple-baseline	8yr. 10yr. 8yr.	F F F	5yr. 4yr. 5yr.	M F M	All autism
Colletti & Harris, (1977)	ABAB reversal (withdrawal)	10yr. 11yr. 12yr.	F M M	9yr. 9yr.	F M	Autism; DD
Hancock& Kaiser, (1996)	Multiple-baseline	12yr. 12yr. 8yr.	F F F	53mos. 59mos. 72mos.	M M M	CP DD William's syndrome
James & Egel (1986)	Multiple-baseline	6yr. 10mos. to 8 yr. 1mo. M	F F	5yr. 4yr. 4yr.	M F F	CP MR CP
Schreibman, et al. (1983)	Multiple-baseline	13yr. 11yr. 8yr.	M F F	8yr. 8yr. 5yr.	F M M	All autism
Swenson-Pierce, et al. (1987)	Multiple-baseline	13yr. 13yr. 10yr.	F M F	8yr. 10yr. 6yr.	F F M	All MR
Trent, et al. (2005)	Multiple-baseline	7yr. 9yr.	F F	5yr. 7yr.	F F	All Down syndrome
Tsao & Odom (2006)	Multiple-baseline	11yr 5yr. 5yr. 5yr.	F M M F	4yr. 3yr. 7yr. 8yr.	M M M M	All autism

Table 2 - Measurement Procedures: Data Collection of Primary Data, Generalization, Maintenance, Reliability, & Social Validity

Study	Primary data collection	Generalization	Maintenance or follow-up	Reliability	Social validity
Celiberti & Harris (1993)	10 min session 10 s intervals	Novel toy – probes during intervention & 16 week follow-up	3, 6, & 16 wks after post intervention	All training sessions	Ratings of pre/post video vignettes
Colletti & Harris (1977)	1. First study: 20 min session 10 s intervals 2. Second study: 20 min session 15 s intervals	None	1. 5 wks post intervention 2. None	Across sessions	None
Hancock & Kaiser (1996)	10-15 min audiotape coding with Sibling Incidental Teaching Code	Snack time	1, 2, and 3 mos. post intervention	30% of sessions	None
James & Egel (1986)	10 min session 5 s intervals	Across typical peers for 2 pairs & across setting for 1 pair	6 mos. post intervention	One-third of sessions	Parents completed questionnaire
Schreibman, et al. (1983)	15 min session 30 s intervals	Research setting	None	One fourth of sessions	Parents completed informal social validation scale
Swenson-Pierce, et al. (1987)	Observation	Novel task probes pre/post intervention	1 to 2 times a week	48% and 75% of sessions	Siblings & parents completed questionnaire
Trent, et al. (2005)	5 min session 10 s intervals	None	1 month after intervention	25% of sessions	None
Tsao & Odom (2006)	10 min session 10 s intervals	Church, school, and backyard	Without prior training or prompts (only 1 sibling pair)	20% of sessions	Ratings of pre/post video vignettes

Table 3

Intervention Features: Procedures & Target Behavior of Siblings and Children with Disabilities

Study	Procedures	Siblings' target behavior(s)	Child w/ disability's target behavior(s)
Celiberti & Harris (1993)	1. Trainer's demonstration of three sets of "teaching" skills: (a) how to elicit play and play-related language (b) how to praise for appropriate responding (c) prompt non-responding and correct inappropriate responding 2. Siblings' practice of the behaviors with children with autism and role-played with the trainer if necessary 3. Trainer's demonstration of sophisticated use of specific technique	1. Elicitation play response 2. Praising 3. Prompting	Appropriate response to siblings elicitation to engage in play behavior
Colletti & Harris (1977)	Sibling was to provide contingent food reinforcement and praise to children with disabilities after correct response.	1. First study: food reinforcement 2. Second: (a) food reinforcement and (b) praise	1. Engagement in stringing bead 2. (a) correcting addition problem, (b) correcting written letter, and (c) decreasing out-of-seat behavior
Hancock & Kaiser (1996)	1. Four intensive training sessions for siblings lasting 45 min: (a) present a written manual and discuss material in manual (b) view video of other child trainers (c) view video of siblings and target child recorded during baseline (d) role play with adult trainer and practice 2. Play sessions for two times a week lasting 30 to 45 min: (a) brief review of milieu techniques with siblings (b) implement play with children with disabilities (c) trainer provided ongoing coaching/feedback (d) brief update about the progress of both children to the mother	1. Milieu teaching (e.g., teaching episodes, consequation of child target verbal responses, acknowledgment of child's verbal initiations, instructions for nonverbal behavior, questions that required a yes/no answer from the target child) 2. Turn taking w/ target child	1. Child's language targets: increase utterances, increased use of specific language target (e.g., prepositions, adjectives), and increased spontaneous use of language target 2. Turn taking w/ sibling
James& Egel (1986)	1. Sibling training (5 days a week for 12 to 15 min sessions): (a) trainer modeling how to initiate interactions, prompt responses, and reinforce both initiations and responses (b) practice with coaching/feedback 2. Target child social initiation training w/ incidental teaching format: (a) siblings help children with disabilities' initiation (b) practice the procedures with experimenter and their siblings (c) siblings provided prompts for an initiation	Positive reciprocal interaction [motor-gestural behavior (e.g., sharing, assistance), vocal-verbal behavior (e.g., play organizer, statements), and temporal characteristics (e.g., initiation)] with children with disabilities	Reciprocal interaction behaviors (e.g., social initiation, social response)
Schreib-man, et al. (1983)	(a) Siblings' view of a video and discussion of examples of reinforcement, shaping, and discrete trial techniques. (b) Discussion about how the techniques are applied to other contexts. (c) General review of behavior modification techniques (d) Instruction/coaching to the siblings during practice w/ target child	Correct use of 5 behavioral modification procedures [i.e., S^D's (e.g., instructions and questions), prompts, shaping, consequences, discrete trials]	Correct responding to the siblings' behavioral modification (e.g., preposition discrimination)
Swenson -Pierce, et al. (1987)	(a) Explain siblings' role (b) Overview and discussion of prompting and social praise (c) Analysis of the training tasks (d) Role play with trainers and instruction/coaching from trainers	Acquisition and generalization of the instructional techniques (i.e., prompting, social praise)	Acquisition of specific domestic skills (e.g., bed making, table setting)
Trent, et al. (2005)	(a) Present the use of a Responsive Interaction Pictorial Manual (b) Siblings discussed with trainer about the use of a RIPM (c) Role play using the strategies of a RIPM (d) Discuss (e) Practice the activity in play sessions	Use of responsive interaction strategies (i.e., mirroring, verbal responding)	All verbal behaviors & a topic-related verbal turn
Tsao & Odom (2006)	10 min social skills lesson using modified elements of effective peer-mediated intervention programs for the siblings: (a) Review day lessons (b) Learn new skills and read a story illustrating the use of the skills (c) Have examples of new behaviors and practice the behaviors (e) Parents helped to explain the story to the siblings who do not understand well.	Social behaviors (i.e., social initiation, negative social initiation, social response, negative social response, and no social behavior)	1. Social behaviors 2. Child orientation (e.g., joint attention, attending to the sibling/on-looking, stereotypical behavior)

CHAPTER 3

Effects of a Sibling-Implemented Intervention Focused on Social Interaction Skills for Young Children with Disabilities

Abstract

The findings of a recent research synthesis (Kim & Horn, 2010) provides support for siblings as effective intervention agents for learning and improving their siblings with disabilities' age appropriate skills. In addition, a large body of research is available in which peers have been demonstrated to be powerful intervention agents for enhancing social skills of children with disabilities. Thus taken together, it would seem logical to assume that siblings can be successful intervention agents for enhancing their siblings with disabilities' social interaction skills. Thus, the purpose of this study is to assess the potential of siblings as an important intervention agent by systematically teaching them appropriate social skills and strategies in order to improve the social interaction skills of their siblings who have difficulties with socializations. Three sibling and child dyads and each of their parents participated in the study. Using a single-subject, multiple baseline design across the sibling and child dyads, social behaviors of the siblings and the children were measured to investigate the effects of the sibling-implemented intervention. The siblings were taught some specific social skills and strategies in the intervention. After the intervention, both siblings and children with disabilities demonstrated positive changes in their play engagement and social interaction. Results of the study indicate that the siblings were able to learn and use specific social skills and strategies in interacting with their siblings with disabilities resulting in positive impact on their siblings with disabilities' social interactions. Finally, summary of the findings, limitations of the study, implications for research and practice are discussed.

Chapter 3

Effects of a Sibling-Implemented Intervention Focused on Social Interaction Skills for Young Children with Disabilities

Young children make significant gains in the development of their social skills during their early years of life through a variety of experiences with different people including family members, relatives, teachers, and peers (Brown, Odom, & Conroy, 2001; Odom, McConnell, & Brown, 2008). Thus, children's early learning and development of social skills play a foundational role for their life-long social adjustment and socialization (Brown, Odom, & Conroy, 2001; Guralnick & Neville, 1997; Janney & Snell, 2006; Odom, McConnell, & McEvoy, 1992; Odom, McConnell, & Brown, 2008). For that reason, acquisition of peer-related social competence is seen as a particularly important early learning developmental outcome for the preschool children (Ladd, 2005; Odom, et al., 1999; Odom, Zercher, Li, Marquart, Sandall, & Brown, 2006). Social competence is defined as a composite of children's ability to cultivate relationships and interactions with adults and other children in their environments (Stanton-Chapman, Denning, & Jamison, 2008). Social competence, thus, also plays an important role in the building of positive peer social relationships (Odom et al., 1999; Odom, Zercher, Li, Marquart, Sandall, & Brown, 2006; Odom, McConnell, & Brown, 2008). Building positive peer relationships, furthermore, has been shown to support the child's successful adjustment to school life including ongoing social participation in peer groups, academic performance, and long-term social adjustment (Bagwll, Schmidt, Newcomb, & Bukowski, 2001; Flook, Repetti, & Ullman, 2005; Ladd, 2005; Odom, Zercher, Li, Marquart, Sandall, & Brown, 2006).

Young children spend large amount of time with their siblings in the ongoing routines and contexts of their family (Azmitia & Hesser, 1993; Downey & Condron, 2004; El-Ghoroury

& Romanczyk, 1999; Kim & Horn, 2010; Stoneman, 2005; Tsao & Odom, 2006). Interactions and relationships with siblings are a potentially powerful influence on children's social development even more than parents because siblings have the longest and the most intimate peer relationships (Azmitia & Hesser, 1993; Stoneman, Brody, Davis, & Crapps, 1989). Social experiences with siblings, such as problem solving to address conflicts and negotiating relationships, support the development of children's social skills (Downey & Condron, 2004). Through these experiences, children may learn how to express and control their emotions and feelings and find ways to maintain good relationships with others. Therefore, young children's social experiences with siblings have the potential to significantly impact their later social life (Azmitia & Hesser, 1993).

Children with disabilities, however, may experience less benefit from these natural learning opportunities because of specific developmental skill delays, behavioral problems, and lack of social competence that may act as barriers to accessing peer play experience and other natural learning and practice opportunities (Guralnick, Hammond, Conor, & Neville, 2006; Kim & Horn, 2010; Knott, Lewis, & Williams, 2007; Strain & Danko, 1995; Tsao & Odom, 2006). In fact, children with disabilities regardless of type of disability commonly have been reported to have limited opportunities for social interactions with peers in their educational settings because of their lack of social competence and basic social interaction skills (Freeman & Kasari, 1998; Guralnick, et al., 2006; Janney & Snell, 2006; McConnell, 2002; McConnell & Ostrosky, 2008; Odom et al., 1999). Children with disabilities frequently exhibit the following deficits in their social skills and thus have less opportunity to develop friendships: (a) withdrawal from or avoidance of interactions with others, (b) interacting less frequently with peers, (c) initiating interactions less often, and (d) no responding or inappropriately responding to others (Guralnick,

Gottman, & Hammond, 1995; Guralnick, Connor, Hammond, Gottman, & Kinnish, 1996a; Guralnick, Connor, Hammond, Gottman, & Kinnish, 1996b; Janney & Snell, 2006; Odom et al., 1999).

These same social skill issues can also be a serious impairment for the child's with disabilities relationships and interactions with their siblings (Downey & Condron, 2004; Kim & Horn, 2010; Knott, Lewis, & Williams, 2007; Stoneman, 2005). Siblings may become frustrated by repeated failures to interact or sustain interactions with their siblings with disabilities in their daily routines (Kim & Horn, 2010; Knott et al., 2007; Stoneman, 2005). As a result, both children with disabilities and their typically developing siblings may have limited learning opportunities even though they spend much time together in their family contexts (Kim & Horn, 2010; Knott, et al., 2007). However, given the importance of sibling relationships and interactions as an essential foundation for developing positive peer relationships, the potential for siblings serving in the role of intervention agents for improving social skills of their siblings with disabilities makes logical sense (Lobato & Tlaker, 1985; Powell, Salzberg, Rule, Levy, & Itzkowitz, 1983).

Siblings' roles as intervention agents are, in fact, supported by the findings of a recent research synthesis (Kim & Horn, 2010). Kim and Horn in their recently completed research synthesis reviewed the empirical research addressing sibling-implemented interventions to address the question as to whether siblings can serve as effective intervention agents for improving age appropriate skills of their siblings with disabilities. Given that all of the identified studies used single-subject methodology, standards for determination of adequate research quality and sufficient evidence for single subject methods recommended by Horner and colleagues (2005) was used to synthesize the information. The conclusion of the synthesis was

that siblings can serve as effective intervention agents for their siblings with disabilities' learning and improving a variety of age appropriate skills including communication, social, and adaptive skills. While only two studies in this review specifically focused on enhancing social interaction skills, the results do provide strong support for our assumption that siblings could also play a critical role as intervention agents for specifically improving the social interaction skills of their siblings who have difficulties with socialization.

A large body of research is available in which peers have been demonstrated to be powerful intervention agents for enhancing social skills of children with disabilities, particularly, children with autism (e.g., DiSalvo & Oswald, 2002; Goldstein, Kaczmarek, Pennington, & Shafer, 1992; Gonzalez-Lopez & Kamps, 1997; Kamps et al., 1992; Kamps, Potucek, Lopez, Kravits, & Kemmerer, 1997; Kohler, Strain, Maretsky, & DeCesare, 1990; Laushey & Heflin, 2000; Lefebvre & Strain, 1989; Odom, Hoyson, Jamieson, & Strain 1985; Odom & Strain, 1986; Odom & Watts, 1991; Zanolli, Daggett, & Adams, 1996). All of these studies provide a strong empirical base for the conclusion that peer-implemented interventions are an evidence-based practice in that they have demonstrated that substantial improvements in social interaction skills of children with disabilities were achieved (Odom, Brown, Frey, Karasu, Smith-Canter, & Strain, 2003). In these studies, the peers were taught specific social skills and strategies to support their initiation and response to children with disabilities and for sustaining interactions once begun. It would appear that these same strategies could be used with siblings. Furthermore, the evidence base available for the peer-implemented intervention provides an excellent indication that siblings would also need to be systematically taught appropriate social skills and strategies for being a successful intervention agent.

The purpose of this study, thus, is to assess the potential of siblings as an important intervention agent by systematically teaching them appropriate social skills and strategies in order to improve the social interaction skills of their siblings who have difficulties with socializations. Specifically, the study investigated the following three research questions: (a) Does the sibling-implemented intervention promote typically developing siblings' play related social interactions with their siblings with disabilities? (b) Does the sibling-implemented intervention promote children with disabilities' total social interactions with their siblings? and (c) Does the sibling-implemented intervention result in socially valid changes in the children's play related social interactions?

Method

The following sections provide a complete description of the participants and setting, pilot study conducted for field testing the intervention and measurement procedures, experimental design and procedures, and measurement procedures.

Participants and Setting

Participant recruitment. Potential family participants were identified with the assistance of local/regional family support and advocacy associations (e.g., Families Together, Lawrence Autism Society). Specifically, the directors of the family associations were contacted and the purpose of the study was explained. Once the researcher had completed the necessary approval process for the agency/association, the directors asked to recommend potential participants for the study. Participants were three preschool aged children with disabilities [Note: in the remainder of this document referred to as child(ren)], their older siblings [Note: in the remainder of this document referred to as sibling(s)], and one of their parents. Therefore, a total of nine participants participated in the study including six children, that is, three sibling and child

dyads, and their parents. The parents who had expressed interest in participating in the study were provided a consent form and questionnaires for child and sibling information. After completion of the consent form and the questionnaires from these prospective parents, the researcher determined which of the participants best met the criteria established for participation in the study. Appendix A provides a copy of the proposed informal consent form and questionnaires.

The parent questionnaires were composed of three different parts: (a) child information items, (b) items assessing child social skills, and (c) items for understanding sibling characteristics (i.e., age, gender, relationship with the child, overall social skills, willingness for participation, cognitive skills). In order to assess the child's current status of social skills, a nine item five-point likert scale (i.e., 1=never, 2=rarely, 3=sometimes, 4=often, 5=very often) adapted from the Family Report section of the *Assessment Evaluation and Programming System* (AEPS) (Bricker, 2002) was used. Using this scale, a score of 3 or less would indicate that the child could benefit from additional opportunities to learn and achieve competence on the social skills. Therefore, children who received a total score of 27 or lower (i.e., average rating of 3 or less for the 9 items) participated in the study.

In order to establish an understanding of the characteristics of the sibling that has been noted in the literature to impact the successfulness of peer and/or sibling provided interventions, a six item five-point likert scale (i.e., 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree) was developed. The items were designed to assist in determining if the siblings met the following inclusion criteria: (a) the sibling is older than his or her sibling with a disability however, the age gap between the siblings should not exceed five years, (b) the sibling indicates a willingness to participate in the study, (c) the sibling's social skills should be reported

by the parent as socially more advanced than their sibling with a disability, and (d) the sibling's cognitive abilities, based on parent report, is at a level that would indicate they are able to understand and participate in the training activities and learn to implement them with their sibling with a disability. Siblings who did not meet the above inclusion criteria were not included in the study. Results of the sibling characteristics items, furthermore, were utilized for post intervention analysis to assess potential influence of specific characteristics on the effects of sibling-implemented intervention.

Participant demographics. Three siblings and their siblings with disabilities (referred to as the child) participated in this study. Specific demographic information for the siblings is provided in Table 1. All three siblings were Caucasian females and two to three years older than the child with a disability. Peyton was diagnosed with ADHD but her social skills were much more advanced than her brother who was the child with a disability according to her parents. She met all of the inclusive criteria that were described in the previous section. Her relationship with her brother was relatively good but sometimes she did not want to share some toys with him and her brother tended to ignore his sister. She was a second grader at the beginning of the study. Terry has a very good relationship with her brother, Sam, and has been an excellent play partner and model for Sam as reported by her parents. Terry's parents also indicated that her cognitive abilities were age appropriate and that she was doing well in her first grade classroom. Libby, the final sibling, also was reported by her parents to have a relatively good relationship with her sister, Penny. She frequently plays with Penny and frequently provides her with appropriate assistance. Libby has age appropriate social and cognitive skills and those was noted by her parents to be capable of participating in the training and implementing the procedures with

Penny. All three siblings were reported by their parents as being willing to participate in the training.

All three children with disabilities were in the preschool age range and were Caucasian. The children's demographic information is described in Table 1. Gary, whose sibling is Peyton, was a 5-year-old boy at the beginning of the study. He was diagnosed with Autism and was receiving speech/language therapy and early childhood special education services through the local school district. He attended a special education class which included children with and without disabilities. Gary's social skill was reported as poor by his parents. He uses simple word and typically single word utterances to communicate basic needs such as 'thank you,' 'open,' or 'jump'. Sam, a 5-year-old boy, whose sibling was Terry, attended a public school preschool program which included children with and without disabilities. He was diagnosed with Autism and was receiving occupational therapy, speech/language therapy, and early childhood special education services. Sam's parents reported that his social skills were relatively good but not age appropriate. He is able to express what he likes and dislikes using simple sentences. Penny, the 44 month-old sister of Libby, was diagnosed with developmental delays as well as several significant health issues (e.g., polymicrogyria, epilepsy, auditory sensory disorder). She attended an early childhood special education class including children with and without disabilities. She was also receiving physical therapy, occupational therapy, and speech/language therapy. Penny has significant physical limitations with the result that she has only very limited independent movement abilities of her extremities. She does have a bit more control of the right side of her body. She is able to hold small object with her right hand when provided with assistance to grasp them. She is also able to smile and visually engage with others by turning her head and following with her eyes.

Setting. The study took place in the homes of the participants (i.e., children with disabilities, siblings, and their parents). For the first meeting, the researcher visited the participants' homes to further clarify for the family the purpose of the study, the content and duration of the training and intervention, and the expected roles of each individual, and to establish a proposed regular schedule for the conducting the baseline, training, and intervention assessment sessions. The researcher explained to the parents that meetings for training are regularly scheduled, that is, twice a week lasting a minimum of 30 minutes. Then, the researcher asked the parents their and their children's most convenient times and days of a week in which to participate. The schedule set on a monthly basis and remained as consistent as possible with some flexibility considering unexpected schedule changes of the families (e.g., vacations, holidays, illness, and any other events that would significantly affect the participants' ability to participate in the study). The parents were asked, as were the researcher, to inform the other of the need to cancel or reschedule in advance using email or phone as mutually determined. For each meeting, the researcher contacted the parents at least one day before the scheduled meeting to confirm.

Once the regular meeting dates and times had been scheduled, the researcher discussed with the parents the appropriate places within the family's home for the children's play (e.g., living room, playroom). Toys, materials, or activities that had been noted through discussions with the parents and observations of the children as preferred for both the siblings and the children and facilitate children's interactions (e.g., dramatic play materials, toy vehicles) were chosen for use in the play sessions.

Pilot Study

During the recruitment period and prior to beginning the actual single case study, an abbreviated intervention was conducted with a family to assess the viability of the training procedures and measures. The pilot was conducted with a family who had an 11 year-old daughter and a nine year-old son with a disability. According to the mother, the sibling had a good relationship with her brother and was willing to participate in the pilot study. The researcher explained the study purpose, intervention procedures, and the role of the sibling to the mother and the sibling. For baseline, the researcher asked the sibling to play with her brother just as they did in their daily routines while she videotaped 10-minutes of their play. Then, the researcher completed the sibling training with the sibling using the scripts of training sequences that are provided in the method section. After completing the sibling training, the researcher asked the sibling to play with her brother using the skills and strategies that she had learned. The researcher again videotaped approximately 10-minute of their play. As a final step the researcher asked the sibling to describe her feeling about participating in the training. Specifically the sibling was asked whether she felt that the skills and strategies were described and presented clearly and easily enough for her to understand and learn. The sibling during the interview said that she felt that the researcher clearly described the skills and strategies and thus she was able to easily understand and learn the skills and strategies. Based on the implementation and the feedback from the sibling no changes were determined to be needed in the training procedures.

Based upon issues encountered during the data coding conducted as a part of the pilot study, two revisions were made to the data coding procedures. First, social interaction behaviors in the initial coding system included all social interactions whether they were appropriate to and related to the play situation or unrelated to supporting the child's play engagement. During the

pilot study, the sibling regularly engaged in non-play related social interactions with her brother such as hugging and kissing him non-contingently. This resulted in a similar rate of social interactions in baseline and intervention but did not reflect the change in the quality of the social interaction or more specifically the change in ratio of play related social interaction and non-play related social interaction. Thus, the social interaction code was divided into two categories – play related and non-play related. Second, a duration criteria was added to the definitions of social interaction behaviors to address an interobserver reliability issue and again to better match the definition to the expected outcome of the intervention. Specifically, under the new definitions a social interaction was coded only if the duration was at least 5 seconds. This change was made because siblings' very brief initiations (e.g., 1 to 2 seconds of duration) such as calling the child's name were not considered to be meaningful social interaction behaviors.

Experimental Design and Procedures

A single-subject, multiple baseline design across the sibling/child dyads were implemented to evaluate the effects of sibling-implemented intervention for improving the social skills of children who have difficulties with socialization. The study was comprised of three phases: baseline, intervention, and maintenance. Specifically, the intervention phase included (a) intervention training sessions (i.e., providing training to the sibling) and (b) intervention assessment sessions (i.e., assessing children's social interaction behaviors during play sessions). All sessions across two phases (i.e., baseline, intervention) took place twice a week in the children's home (i.e., a sibling and a child with a disability. For Peyton, but only for Peyton because of her relatively short attention span, intervention training was implemented three times a week. Once the first sibling/child dyad displayed a relatively stable level of interaction in the baseline phase, the intervention training was implemented for the first dyad while the other two

dyads remained in the baseline phase. Once the first sibling/child dyad attained a desirable change in both level and trend, the second dyad began the intervention training. The same strategy subsequently was implemented with the final (third) sibling dyad.

Baseline phase. During the baseline phase, the sibling was asked to play with his or her sibling with a disability together in a typical manner for approximately 10 minutes. During this play time, the researcher videotaped and observed the sibling and the child's interactions. No coaching such as prompts, praises, or instructions by any adult (i.e., a researcher, a parent) was provided during the baseline phase. However, if the child left the play or engaged in a tantrum or other negative behaviors, the observation was paused and the parent was asked to help the child calm and return to the play session.

Intervention phase. The intervention consisted of multiple tasks. The following two primary activities were conducted and explained in detail below: (a) the researcher and sibling working through the training materials together followed by the sibling practicing the strategies with the child while receiving coaching from their parent and the researcher (i.e., intervention training) and (b) play time with videotaped recording for the purpose of conducting an assessment of skill acquisition (i.e., intervention assessment).

Intervention training. Prior to the intervention assessment sessions and following the baseline phase, the sibling and their parent participated in training provided by the researcher to learn facilitation strategies with the aim of promoting the child with a disability's positive peer interactions in the context of play. The intervention training session lasted approximately 10-to-40 minutes depending on the amount and difficulty of skills and strategies being taught. The intervention training sessions, as with sessions of other phases, were conducted approximately twice a week for each sibling and child dyad.

The intervention training used a three step process that has been adapted from the "Stay-Play-Talk" procedure developed by English and colleagues (English, Shafer, Goldstein, & Kaczmarek, 1997) for peer training. Furthermore, specific strategies modified from the Social Skills Curriculum developed by Strain and colleagues (Strain, Danko, & Lawry, 1998) were added to the training content. The three steps in the training were "Stay," "Stay and Play," and "Stay, Play, and Talk." Thus, for Step one-*Stay*, the sibling was taught how to move into physical proximity of the child with a disability, stay in proximity, and gain the child's attention. For Step two-*Stay and Play,* the sibling was taught to gain the attention of the child and join in play together with the child. Finally, for Step three-*Stay, Play, and Talk*, the sibling was taught how to begin a conversation with the child while continuing to play together with the child. A more detailed description of the definition of each step is provided in Table 2.

The following sections provide detailed descriptions of each of the three steps (i.e., "Stay," "Stay and Play," and "Stay, Play, and Talk") as they were presented to the sibling during the intervention training sessions. Prior to beginning the intervention training, the children's parent received all of the information regarding the intervention training including definitions of the three steps, the training component and sequence for each of the three steps, descriptions of the social strategies that the sibling will learn, and descriptions of the parent's role for sibling/child practice. Using anecdotal notes, the researcher recorded the nature of each researcher/sibling training session including sibling's ease in learning the skills and strategies and modifications/adaptations used to facilitate the sibling's learning. In addition, the researcher noted any needed changes to the planned training based on the sibling's age and level of skills in playing with the children.

Step 1- "Stay." The intervention training began with the Step 1-*Stay*. The first part of the intervention training (i.e., researcher/sibling training session) for *Stay* included the following components: (1) researcher provides a definition of the skill to the sibling, (2) sibling completes verbal rehearsal of the definition, (3) sibling applies the skill to an example provided by the researcher, (4) researcher provides instruction on the use of a "cue card," (5) researcher models the skill for the sibling, and (6) researcher and sibling role play the use of the skill. Table 3 provides an example script of the training process for *Stay*. The sibling/child practice component with coaching from the adults was not conducted for this step given that the training content is relatively simple and straightforward. Rather, the skill that the sibling learned for Step one-*Stay* was practiced in combination with the skill and strategies for Step two-*Stay and Pla*y during the sibling/child practice session for *Stay and Play*. The training session for *Stay*, thus, lasted approximately 5 to10 minutes.

Step 2-Stay and Play. After completing the session for the Step 1-*Stay*, the intervention training session for Step 2-*Stay and Play* was conducted. The first part of the intervention training session (i.e., researcher/sibling training session) for *Stay and Play* included nine components: (1) Sibling reviews the skills that she or he learned in the previous step, (2) researcher provides a definition of the skill for Step 2 to the sibling, (3) sibling completes verbal rehearsal of the definition, (4) sibling applies the skill to an example provided by the researcher, (5) researcher provides instruction on the use of a "cue card," (6) researcher provides instruction on the use of social strategies (i.e., sharing, requesting to share, see Table 5) that help the sibling to use the skill, (7) researcher models the skill and strategies for the sibling, (8) researcher and sibling role play the use of the skill and strategies, and (9) sibling practices the skill and strategies with the researcher. Table 4 provides an example script of the training process for *Stay*

and Play. Then, sibling/child practice session for the combined steps, *Stay* and *Stay and Play*, followed.

Individualized adjustments to the training process script are made to accommodate the needs and characteristics of each family. For example, for Terry and Libby, since they already routinely initiated play with their sibling, the researcher combined the scripts for Step 1 and 2 and taught the skills in one session. For Penny, given her numerous physical limitations restricting her independent movement and access to play materials, additions and modification to the training content for Step 2 were made. That is, Libby, Penny's sibling, was taught to visually offer two choices of toys or play activities to Penny, and asked to Penny to indicate a choice as the method for initiating play rather than asking Penny to play with her. Libby was also taught to sit at a distance and in a direction that allowed Penny to easily see her and her play actions, while simultaneously facilitating Libby's access to the toy or material provided by Libby.

In the second part of the intervention training session (i.e., sibling/child practice session) for *Stay and Play*, the sibling and the child received coaching from their parent and the researcher. The researcher coached the sibling's practice providing prompts, feedback, praise, and help (e.g., showing a cue card) if necessary while the parent coached the child providing prompts and helps. Table 7 provides a description of the sibling/child practice session and the adults' role. The intervention training for Step 2-*Stay and Play* lasted approximately 10 to15 minutes.

Step 3- Stay, Play, and Talk. After completing the session for the Step 2-*Stay and Play*, the intervention training session for Step 3-*Stay, Play, and Talk* was conducted. The intervention training (i.e., researcher/sibling training session) for *Stay, Play, and Talk* included the following nine components: (1) Sibling reviews the skills that she or he learned in the previous steps (i.e.,

Step 1-*Stay*, Step 2-*Stay and Play*), (2) researcher provides a definition of the skill for Step 3 to the sibling, (3) sibling completes verbal rehearsal of the definition, (4) sibling applies the skill to an example provided by the researcher, (5) researcher provides instruction on the use of a "cue card," (6) researcher provides instruction on the use of social strategies (i.e., offering help, suggesting play skills, play organizing, compliment, see Table 5) that help the sibling to use the skill, (7) researcher models the skill and strategies for the sibling, (8) researcher and sibling role play the use of the skill and strategies, and (9) sibling practices the skill and strategies with the researcher. Table 5 provides an example script of the training process for *Stay, Play, and Talk*.

In the second part of the intervention training session (i.e., sibling/child practice session) for *Stay, Play, and Talk*, the sibling and the child received coaching from their parent and the researcher. The researcher coached the sibling's practice providing prompts, feedbacks, praises, and helps (e.g., showing a cue card) if necessary while the parent coached the child providing prompts and help (see Table 7). The intervention training session for Step 3-*Stay, Play, and Talk* lasted approximately 30-to-45 minutes.

Intervention assessment. Following the intervention training sessions, the intervention assessment (i.e., video-taped play session) was conducted in order to assess the effects of the training. The intervention assessment sessions were conducted in two sequential parts: (a) the sibling practices with the child receiving coaching from the researcher and their parent (i.e., practice and coaching sessions) and (b) sibling and child's play time without coaching from adults (i.e., play sessions). Specifically, the sibling participated in sessions for part one, practice and coaching sessions, and then moved to part two, play (without coaching) sessions, after substantial changes had been noted during the practice and coaching sessions as determined by visual inspection of the data. The following sections provide detailed descriptions for each part

of the intervention assessment sessions including the role of the adults, expectations for the children, and the strategy for moving to the next set of sessions.

Practice and coaching. The sibling practiced the combined skills and strategies that had been taught for all three steps (i.e., Step 1-*Stay*, Step 2-*Stay and Play*, Step 3-*Stay, Play, and Talk*) with the child while receiving coaching from the researcher and parent. The sibling, the child, their parent, and the researcher participated in this session. Prior to the playtime assessment, the researcher provided brief instructions to the sibling, the child, and the parent regarding their role for the playtime assessment component. The researcher also described her role to all of the participants in the playtime assessment component. Table 7 provides an example script for each person's role during the playtime assessment component. The researcher asked the sibling to play as usual with the child but to use the combined skills and strategies that they had been taught. The researcher provided coaching such as visual (i.e., cue card) and verbal prompts while the sibling played with the child. The children's parent was also asked to intervene with either of her children in order to prevent or diffuse the display of a challenging behavior. The researcher operated the video equipment for recording in a manner which was the least intrusive for the playtime assessment.

As the sibling began to show that they could successfully use the skills and strategies and rarely needed prompts or cues from adults (i.e., the researcher, the parent), the adults began to withdraw their coaching. For example, the researcher provided coaching such as showing a cue card or providing verbal prompts to the sibling if the sibling did not appropriately use the skills they had learned within five seconds. However, as the sibling began to use the skills and strategies more confidently and thus displayed some improved use of the skills and strategies, the researcher decreased the frequency of showing the cue card, providing verbal prompts, and other

corrective strategies. Then, as the sibling began to proficiently use the skills in interacting with the child (i.e., during the playtime the sibling appropriately and consistently used several of the skills to engage the child), the researcher fully withdrew her coaching including the provision of immediate positive feedback.

Once the sibling's use of the combined skills and strategies for Step 1, 2, and 3 in interacting with the child had substantially increased over the baseline phase and the increase was at a stable level for several sessions (i.e., a minimum of two sessions), the play session without coaching from adults began. The researcher videotaped for the purpose of later coding during the coaching and practice sessions. Each session lasted approximately 5 to10 minutes.

Play (without coaching). The sibling played with the child using the combined skills and strategies for all three steps (i.e., Step 1-*Stay*, Step 2-*Stay and Play*, Step 3-*Stay, Play, and Talk*) without coaching from adults. Prior to the play session, the researcher provided brief instructions to the sibling, the child, and the parent regarding their role for the play sessions (see Table 8). The researcher also described to all of the participants her role in the play sessions. Play sessions were continued until the sibling's use of the combined skills and strategies for Step 1, 2, and 3 in interacting with the child had substantially increased over the baseline phase and the increase was at a stable level for several sessions (i.e., a minimum of four sessions). The researcher videotaped for the purpose of later coding during the play sessions. Each session lasted approximately 5 to10 minutes.

Maintenance phase. Following the intervention assessment sessions, the maintenance phase was conducted. The researcher conducted sessions and collected the data once one week and three weeks following the completion of the final intervention assessment phase session. Therefore, a total of two sessions was collected to assess maintenance of outcomes for each of

the sibling and child dyads except one dyad who were not available for the second maintenance session due to their limited timeline. The same procedures as used during the play sessions of the intervention assessment phase was used and thus the sibling played with the child using the combined skills and strategies for Step 1, 2, and 3 without coaching from adults. Approximately 5 to 10 minutes of each session was videotaped for later coding.

Measurement Procedures

Both sibling and child social behaviors were measured to assess the effects of the intervention training. A 10-minute observational sample was videotaped for each session and transferred to a laptop computer using GOM Player. To facilitate coding, the 10 minute samples were divided into 10-second observational intervals. A separate sibling and child data coding form was developed and provided in Appendix B. The primary measures (i.e., dependent variables) were (a) social interaction behaviors of the sibling, (b) inappropriate social behaviors of the sibling, (c) social interaction behaviors of the child, and (d) inappropriate social behaviors of the child. Specific definitions of sibling and child social interaction behaviors and their inappropriate social behaviors are described in the following sections. Finally, procedures for assessing social validity, implementation fidelity and inter-observer reliability are presented.

Sibling and child behaviors. Social interaction behaviors of the sibling and the child were assessed as dependent variables. Specifically, social interaction behaviors for the sibling and the child include (a) total social interaction behaviors including non play-related social behaviors and (b) play-related social interaction behaviors (i.e., initiations for the sibling, responses for the child). In addition, inappropriate social behaviors of the sibling and the child during play were assessed. All negative behaviors of the children were considered as inappropriate social behaviors. Social behaviors rating scores were calculated by summing all

10-s intervals in which a social interaction behavior was recorded as occurring and dividing by the total number of 10-s intervals in the videotaped intervention assessment session, and then multiplying by 100 to obtain a percentage. Percent of intervals for inappropriate behaviors was calculated by summing all 10-s intervals in which an inappropriate behavior was recorded as occurring and dividing by the total number of 10-s intervals in the videotaped intervention assessment session and then multiplying by 100 to obtain a percentage. The definitions for each of social interaction behaviors were adapted from the ones that have been used by a number of researchers in conducting peer-mediated interventions (i.e., Gonzalez-Lopez & Kamps, 1997; Kamps et al., 1992; Tsao & Odom, 2006). Initial definitions for child and sibling behaviors were fined tuned to address individual difference noted in sibling/child dyads. Table 9 provides definitions and examples for children's social interaction behaviors.

Social validity. Social validity is designed to understand the larger context of effects of the intervention, that is, social importance of the intervention in terms of educational purpose, acceptability, and practicality (Kennedy, 2005; Wolf, 1978). Wolf and Kennedy suggest that the importance of the purpose, effectiveness of the intervention, appropriateness of the procedures, and/or satisfaction of the participants should be assessed for social validity. Thus, the researcher asked questions regarding importance, effectiveness, and appropriateness of the intervention training and procedures, and participants' satisfaction to the parents and the siblings following completion of the intervention assessment sessions. The questionnaire for parents includes seven questions using a five-point likert scale items (i.e., 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree) and two open ended items. The first part of the questionnaire for the parents asks questions about (a) appropriateness and importance of the intervention training for their children and/or family, (b) ease of participation in the intervention training for parents, (c)

duplicability of the intervention training for parents, (d) helpfulness for their children's interactions during play, (e) helpfulness for their child with a disability's interactions with others, (f) degree of sibling's enjoyment in participating in the intervention, and (g) degree of child's enjoyment in playing with his or her sibling during the intervention. The second part of the parent questionnaire, open ended items, includes questions related to challenges experienced during the intervention and an opportunity to provide other comments.

The questionnaire for siblings includes five questions using a three-point likert scale which uses facial expressions [i.e., 1=no (upset face), 2=don't know (thinking face), 3=yes (happy face)]. The six questions ask of the sibling are: (a) Did you enjoy learning how to play with ____? (b) Did you find it easy to do the new things you learned? (c) Do you believe that you will use the things you learned in the future? (d) Do you find the things you learned to be helpful in playing with ____? and (e) Were there any things that you found hard to do? If so, please give me some examples.

In addition to these questionnaires, segments of videotapes from the baseline phase and the intervention phase were randomly selected by the researcher for assessing social validity. The selected videotape segments were viewed by a group of knowledgeable early childhood professionals (e.g., doctoral students in special education) who were naïve to the phase of intervention they were viewing. After viewing each segment these individuals provided their feedback on the interaction between the two children using a 5 point likert rating scale (e.g., 1=very low, 2=low, 3=neutral, 4=high, 5=very high). Specifically, their rated responses to the following five questions are: (a) Rate the degree to which the sibling actively initiated the joint play activity, (b) rate the degree to which the sibling actively maintained the joint play activity, (c) rate the degree to which the sibling appropriately scaffolds the child's play behavior to

facilitate more sophisticated and appropriate the joint play activity, (d) using the scale, rate the level of enjoyment of the children demonstrated during their play, and (e) rate the level of positive social interaction between the children. Appendix C provides the questionnaire used.

Implementation fidelity. Implementation fidelity of the intervention training was assessed in order to verify the behaviors of the researcher (i.e., the researcher exactly follows the procedures of the intervention training) during the intervention training. The researcher provided written notes of all of the information regarding the intervention training (i.e., definitions of the three steps, the training component and sequence for each of the three steps, descriptions of the social strategies that the sibling will learn, descriptions of each person's role) to the parents. The parents were asked to check 8-item questionnaires for Step 1 and 2 and a 9-item questionnaire for Step 3. For analysis of implementation fidelity ratings, percentages (i.e., number of 'yes' allotted divided by the total number of the questions, then multiplied by 100) were calculated for each of the three steps. Appendix D provides a copy of the proposed questionnaires for the implementation fidelity for each of the three steps (i.e., Step 1-*Stay*, Step 2-*Stay and Play*, Step 3-*Stay, Play, and Talk*) of the intervention training.

Interobserver agreement. The researcher was a primary data collector and coder and coded all sessions. A second trained observer who was naïve to the specific experimental procedures of the study conducted reliability coding on a subset of sessions in each phase of the study. The researcher trained this second coder using the following procedures: (1) The researcher provides the coder with a copy of the definitions and examples of all social interaction and inappropriate social behavior code categories, and the mechanics of data recording system, (2) after the coder reads the material provided, the researcher discusses the coding process with the coder and answers any questions and/or provided clarification, (3) the coder and researcher

practice coding using a few video samples from the pilot study, (4) as a part of the practice coding the researcher and the coder discuss the practice coding procedures and resolve any discrepancies that they have in codes assigned, (5) after completing the "joint coding", the coder then independently practices coding with video samples for the baseline phase, the intervention phases, and the maintenance phase, and (6) using the data obtained by the two coders independently, the researcher analyzes and then discusses the practice coding with the coder to evaluate each for consistency. The researcher trained the coder to a minimum criterion of 80% agreement. Interobserver agreement was assessed for 25% of the sessions for each sibling and child dyad. Interobserver agreement was conducted interval by interval in which the total number of agreements was divided by the total number of agreements plus disagreements, and then multiplied by 100%.

Data Analysis

As data were collected, information for each session was graphed and analyzed on a continuous basis (Kennedy, 2005). Using graphs, the data was visually inspected considering the level, trend, variability, immediacy of effect, and overlap of the data to allow the researcher to better understand the nature of the findings (Kennedy, 2005). The graphed data thus was used to identify patterns and to determine next steps in the study including phase changes.

Results

The current study was designed to provide answers to three questions thus the reporting of the results is organized by each question. Specifically, the first section presents information on the sibling play related social interaction behaviors during baseline, intervention, and maintenance phases thus addressing the question - does sibling-implemented intervention promote typically developing siblings' play related social interactions with their siblings with

disabilities? The second section presents the child social interaction data for baseline, intervention, and maintenance phases and addresses the question - does sibling-implemented intervention promote children with disabilities' total social interactions with their siblings? The third section presents information on participant perceptions of the social validity of the intervention as well as a third party analysis to address the final question –does the sibling-implemented intervention result in socially valid changes in the children's play related social interactions? Two additional sections present the outcomes of the implementation fidelity assessment and inter-observer reliability assessment.

Sibling Social Interaction Behaviors

Data were collected on social interaction behaviors of the siblings and their inappropriate behaviors (i.e., dependent variables) during the play sessions. Specifically, sibling social interaction behaviors were defined as (a) total social interaction behaviors including non play-related social behaviors (e.g., kissing, stroking the child's head or cheeks) and play-related social behaviors and (b) play-related social interaction behaviors. Since the study focused on sibling's use of social interaction behaviors that were directly related to the play activity during the play sessions, play-related social interaction behavior was the primary dependent variable. Furthermore, sibling's play-related social interaction behaviors were focused on the sibling initiating and supporting their siblings and thus recorded if they were initiations by the sibling. In other words, if a play related social interaction occurred that was initiated by the child with disabilities it was not scored as a sibling play-related social interaction. As previously described, the training scripts and contents were revised according to the needs and characteristics of each sibling and child dyad based on the analysis of the baseline data for that dyad. For example, because of Penny's physical movement limitations, Libby was taught to sit facing Penny at a

distance that would allow Penny to easily see Libby's play. Libby was also taught that she might need to and how to provide additional support to Penny in order to facilitate their playing together. For example, Libby was shown how to provide some physical guidance to Penny for activating a button on a toy rather than simply showing Penny how to do it.

Table 10 and Figure 1 provide the data for sibling social interaction behaviors (i.e., percent of 10-s intervals in which the behavior was observed) across the three phases (i.e., baseline, intervention, and maintenance) of the study for all three sibling/child dyads. Specifically, Table 10 summarizes the data by averaging the data across sessions within a phase for the sibling social interaction behaviors for each dyad. Figure 1 graphically displays the data for each dyad for each session across the course of the study. In the following sections each dyad's data will be presented in more detail.

Peyton/Gary dyad. As depicted in Table 10 and Figure 1, Peyton showed moderated levels of variability in her initiations of social interaction behaviors (M=18.5%, range=8%-37%) and play-related social interaction behaviors (M=16.25%, range=7%-37%) directed toward her sibling, Gary, during the baseline phase. The intervention was provided after session 4, only training was provided for session 5 and 6, and during session 7 the first video 10-minute session with coaching was conducted. Across the four sessions in which coaching was provided for Peyton her percent of intervals in which she initiated play-related social interactions with her sibling increased dramatically over her baseline performance (M=56.5%, range=13%-90%). The coaching was then removed for sessions 12 through 20 during the 10 minute video play session but intervention was still being provided prior to the video play assessment sessions. Peyton's performance dropped somewhat during the non-coaching sessions (M=56.1%, range=37%-72%) but continued to be well above that seen during the baseline phase. Peyton's percent of intervals

observed in which she initiated play-related social interaction behaviors towards her sibling one week after completion of the end of the intervention (i.e., maintenance session 22) and three weeks after completion of the end of the intervention (i.e., maintenance session 24) maintained at a high level (i.e., 77% and 80% respectively). In fact, the percent during the maintenance phase was at a higher level than that seen during the intervention.

The percent of intervals observed in which Peyton engaged in inappropriate behaviors was exceptionally low throughout the study (i.e., range of 0% of intervals observed to 5%). She did not display inappropriate behaviors at all during the intervention with coaching phase but did some a slight increase during the intervention without coaching (M=1.78%, range 0%-5%). Although the mean percentage of Peyton's inappropriate behaviors was higher than the mean percentage during baseline, it was not a meaningful difference (i.e., approximately 1% difference). She did not display inappropriate behaviors at all during the maintenance phase.

Terry/Sam dyad. As depicted in Table 10 and Figure 1, Terry showed relatively high levels of variability in her initiations of social interaction behaviors (M=51.5%, range=37%-78%) and play-related social interaction behaviors (M=25.5%, range=0%-60%) directed toward her sibling, Sam, during the baseline phase. The intervention was provided after session 8, training was provided for session 9 and 10, and during session 11 the first video 10-minute session with coaching was conducted. Across the two sessions in which coaching was provided for Terry the percent of intervals in which she initiated social interactions with her sibling increased over her baseline performance (i.e., 65% and 88%, respectively). The coaching was then removed for sessions 14 through 21 during the 10 minute video play session but intervention was still being provided prior to the videoed play assessment sessions. Terry's performance (M=61.4%, range=47%-80%) dropped somewhat during the non-coaching sessions

but continued to be well above that seen during the baseline phase. In particular, Terry's performance for session 14 and 20 was similar to that seen during the intervention with coaching phase. Terry's percent of intervals observed in which she initiated social interaction behaviors and play related social interaction behaviors towards her sibling, Sam, one week after completion of the end of the intervention (i.e., maintenance session 23) maintained at a high level (i.e., 79% for total social interaction behaviors, 76% for play-related social interaction behaviors). Terry's mother requested to end the study because of family scheduling concerns, thus, only one maintenance video play assessment session was obtained.

The percent of intervals observed in which Terry engaged in inappropriate behaviors was relatively low throughout the study (i.e., M=2.75%, range of 0%-17%). She did not display inappropriate behaviors at all after the baseline phase, that is, no inappropriate behaviors occurred during the intervention with coaching, the intervention without coaching, and the maintenance phases. This result indicates that Terry displayed more positive social interactions during play after she learned how to use appropriate social skills and strategies from the training.

Libby/Penny dyad. As depicted in Table 10 and Figure 1, Libby showed relatively high levels of variability in her initiations of social interaction behaviors (M=39.56%, range=18%-68%) and play-related social interaction behaviors (M=33.33%, range=17%-67%) directed toward her sibling, Penny, during the baseline phase. The intervention was provided after session 13, training was provided for session 14 and 15 and during session 16 the first video 10-minute session with coaching was conducted. Across the two sessions in which coaching was provided for Libby her percent of intervals in which she initiated social interactions with Penny increased over her baseline performance (i.e., 76% and 88% respectively for total social interaction behaviors, 67% and 76% respectively for play-related social interaction behaviors). The

coaching was then removed for sessions 20 through 24 during the 10 minute video play session but intervention was still being provided prior to the video play assessment sessions. Libby's performance was maintained during the non-coaching sessions at the similar levels seen during the intervention with coaching phase [i.e., total social interaction behaviors (M=85%, Range 79%-90%), play-related social interaction behaviors (M=79.5%, Range 75%-85%)]. Libby's percent of intervals observed in which she initiated play related social interaction behaviors towards her sibling one week after completion of the end of the intervention (i.e., maintenance session 26) and three weeks after completion of the end of the intervention (i.e., maintenance session 29) maintained at a relatively high level (i.e., 76% and 50%, respectively). Libby's performance dropped during the second maintenance session but stayed well above the mean percentage of the baseline sessions.

The percent of intervals observed in which Libby engaged in inappropriate behaviors was relatively low throughout the study (i.e., M=2.11%, range of 0% -13%). She did not display inappropriate behaviors during the following three phases (i.e., intervention with coaching, intervention without coaching, and maintenance) after the baseline. Again we can see that as was the case for Terry, Libby demonstrated improvements in the positive nature of her interactions with Penny after she had learned how to use appropriate social skills and strategies.

Child Social Interaction Behaviors

Data were collected on child social interaction behaviors (i.e., dependent variables) during the video play sessions. Specifically, child social interaction behaviors included (a) total social interaction behaviors including non play-related social behaviors (e.g., kissing, looking at the sibling while the sibling does not interact with the child) and play-related social behaviors, (b) play-related social interaction behaviors, and (c) inappropriate behaviors. Although the data

for both total social interaction behaviors and play-related social interaction behaviors were analyzed, the primary focus was the child's use of play-related social interaction behaviors just as was the case for the siblings. Furthermore, the child's play-related social interaction behaviors were focused on the child's responding to their sibling's initiations and thus recorded only if it was response to their sibling's initiations. In other words, if a play related social interaction occurred that was initiated by the child with disabilities it was not scored as a child play-related social interaction. Child's play-related social interaction behaviors were thus all responses to his or her sibling's initiations.

Table 11 and Figure 2 provide the data for child social interaction behaviors (i.e., percent of 10-s intervals in which the behavior was observed) across the three phases (i.e., baseline, intervention, and maintenance) of the study for all three sibling/child dyads. Specifically, Table 11 summarizes the data by averaging the data across sessions within a phase for the child social interaction behaviors for each dyad. Figure 2 graphically displays the data for each dyad for each session across the course of the study. Additionally, Figure 3, 4, and 5 displays each child and sibling dyad's social interaction behaviors across all three phases to illustrate the relationship and thus covariation of the siblings' play-related social initiations and the child's total social responses. In the following sections each dyad's data will be presented in more detail.

Gary/Peyton dyad. As depicted in Table 11 and Figure 2, Gary showed moderate levels of variability in his responses to initiations of social interaction behaviors (M=13.5%, range=0%-30%) and play-related social interaction behaviors (M=10.75%, range=0%-27%) by his sibling, Peyton, during the baseline phase. Across the four sessions in which coaching was provided to Peyton, Gary's percent of intervals in which he responded to play related social interactions

initiations from his sibling increased somewhat over his baseline performance (M=16%, range=10%-30%). Gary's performance improved somewhat during the non-coaching sessions (M=31.33%, range 13%-61%) but continued to be highly variable throughout and stayed somewhat higher than that seen during the baseline phase. Gary's percent of intervals observed in which he responded to play related social interaction initiation behaviors from his sibling one week after completion of the end of the intervention (i.e., maintenance session 21) and three weeks after completion of the end of the intervention (i.e., maintenance session 24) maintained at the level seen during intervention (i.e., 35% and 59% respectively) and was in slightly higher than the mean during both intervention phases.

The percent of intervals observed in which Gary engaged in inappropriate behaviors during the baseline phase averaged 8.5% across sessions (range 2%-12%). The frequency of his inappropriate behaviors increased during the intervention with coaching phase (M=39%, range 5%-85%). Although the mean percentage of Gary's inappropriate behaviors decreased during the non-coaching intervention sessions (M=21.56%, range 4%-38%), he still displayed higher levels than the mean percentage seen during the baseline phase. The frequency of Gary's inappropriate behaviors increased because he did not respond to his sister's, Peyton, initiations, while Peyton's initiations had increased after the intervention. The frequency of Gary's inappropriate behaviors then decreased during the maintenance phase (M=13.5%, range 7%-20%) which are similar points to those during the baseline phase.

Sam/Terry dyad. As depicted in Table 11 and Figure 2, Sam showed relatively high levels of variability in his responses to initiations of social interaction behaviors (M=24.75%, range=3%-66%) and to play-related social interaction behaviors (M=11%, range=0%-55%) by his sibling, Terry, during the baseline phase. Across the two sessions in which coaching was

provided to Terry, Sam's percent of intervals in which he responded to play related social interactions initiations from his sibling increased over his baseline performance (M=44%, range=43%-45%). Sam's performance decreased somewhat during the non-coaching sessions (M=30.6%, range=14%-52%) and continued to be highly variable throughout the sessions. However, Sam's overall performance during the non-coaching sessions stayed higher than that seen during the baseline phase. Sam's percent of intervals observed in which he responded to social interaction initiation behaviors from his sibling one week after completion of the end of the intervention (i.e., maintenance session 23) maintained at higher level than that seen during intervention (i.e., 73% for total social interaction behaviors, 70% for play-related social interaction behaviors).

The percent of intervals observed in which Sam engaged in inappropriate behaviors during the baseline phase averaged 7.75% across sessions (range 3%-23%). The frequency of his inappropriate behaviors decreased during the intervention with coaching phase (M=4%, range 0%-8%) and then increased somewhat during the intervention without coaching (M=6.4%, range 0%-14%), yet was still lower than that seen during the baseline phase. Sam did not display inappropriate behaviors during the maintenance phase (0%). This result indicates that he had more positive interactions during play with his sister when his sister provided supports and play facilitations to him.

Penny/Libby dyad. As depicted in Table 11 and Figure 2, Penny showed high levels of variability in her responses to social interaction initiation behaviors (M=45.11%, range=17%-62%) and play-related social interaction initiation behaviors (M=23.44%, range=10%-50%) by her sibling, Libby, during the baseline phase. Across the two sessions in which coaching was provided to Libby, Penny's percent of intervals in which she responded to play related social

interactions initiations from her sibling increased over her baseline performance (M=66%, range=58%-74%). Penny's performance stayed at the high level during the non-coaching sessions (M=74.5%, range=67%-85%) with relatively stable and somewhat higher than that seen during the intervention with coaching phase. Penny's percent of intervals observed in which she responded to social interaction initiation behaviors from her sibling one week after completion of the end of the intervention (i.e., maintenance session 26) and three weeks after completion of the end of the intervention (i.e., maintenance session 29) maintained at the slightly lower level than that seen during both intervention phases (i.e., 61% and 47% respectively for total social interaction behaviors, 59% and 43% respectively for play-related social interaction behaviors). However, her performance during the maintenance phase stayed at a higher level than that seen during the baseline phase.

Penny did not display inappropriate behaviors at all across all phases (i.e., baseline, intervention with coaching, intervention without coaching, maintenance). She always responded to her sister's social interaction initiation behaviors by looking at her sister or her sister's play behaviors. Furthermore, she frequently smiled at her sister's initiations of social interaction behaviors during the play sessions.

Interobserver Agreement

As noted earlier, interobserver agreement was collected for 25% of all sessions for each phase (i.e., baseline, intervention with coaching, intervention without coaching, and maintenance) across each dyad. Results of the interobserver agreement for the sibling behaviors and the child behaviors are provided in Table 12 and Table 13.

Sibling behaviors. Interobserver agreement across all dyads' sibling behaviors for all phases (i.e., the overall interobserver agreement for sibling behaviors) was 91% with a range of

70% to 100%. For the "total play related social interaction behaviors", the primary focus of the sibling intervention, across all dyads and phases, an interrater agreement rating of 91% (range 82% to 98%) was achieved. Within the "total play related social interaction behavior" code the highest rating was assessed for Peyton at 94% (range 89-98), followed by Libby at 90% (range 85-95), with the lowest rating for Terry at 87% (range 82-90).

For the "total social interaction behaviors" across all dyads and phases, an interrater agreement rating of 82% (range 70%-98%) was achieved. Within the "total social interaction behavior" code the highest rating was assessed for Peyton at 86% (range 73-98), followed by Libby at 80% (range 74%-85%), with the lowest rating for Terry at 76% (range 70%-84%). The final sibling code category, inappropriate behaviors, an overall interrater reliability rating of 99.9% (range 99%-100%) was achieved. The overall reliability rating for each sibling dyad across each of the sibling code categories and across each phase was as follows: Peyton 93% (range of 73-100); Libby 90% (range of 74-100); and Terry 88% (range 70-100). Thus the lowest levels of sibling behavior interrater reliability were achieved with the "total social interaction behaviors" category (82%) and with the Terry/Sam dyad (88%) both of which are in the acceptable range.

Child behaviors. Interobserver agreement across all dyads' child behaviors for all phases (i.e., the overall interobserver agreement for child behaviors) was 86% with a range of 57% to 100%. For the "total play related social interaction behaviors," the primary focus of the intervention, across all dyads and phases, an interrater agreement rating of 86% (range 74%-97%) was achieved. Within the "total play related social interaction behavior" code the highest rating was assessed for Gary at 89% (range 82%-95%), followed by Sam at 87% (range 81%-97%), with the lowest rating for Libby at 82% (range 74%-93%).

For the "total social interaction behaviors" across all dyads and phases, an interrater agreement rating of 79% (range 57% to 95%) was achieved. Within the "total social interaction behavior" code the highest rating was assessed for Gary at 86% (range 77%-95%), followed by Penny at 77% (range 69%-87%), with the lowest rating for Sam at 76% (range 57%-97%). The final sibling code category, inappropriate behaviors, an overall interrater reliability rating of 94% (range 77%-100%) was assessed. Within the "inappropriate behaviors" code the highest rating was assessed for Penny at 99.8% (range 98%-100%), followed by Sam at 96% (range 88%-100%), with the lowest rating for Gary at 87% (range 77%-95%). The overall reliability rating for each child dyad across each of the child code categories and across each phase was as follows: Gary 88% (range of 77%-95%); Sam 85.96% (range of 57%-100%); and Penny 86% (range 69%-100%). Thus the lowest levels of child behavior interrater reliability were achieved with the "total social interaction behaviors" category (76%) and with the Sam/Terry dyad (85.96%) both of which are in the acceptable range.

Implementation Fidelity

A researcher generated implementation fidelity form which was completed by the parent who was observing the session at the end of each training session (i.e., step 1-*Stay*, step 2-*Stay and Play*, step 3-*Stay, Play, and Talk*) for the siblings. Fidelity rating scores were calculated for each dyad by summing all listed behaviors marked as completed and dividing by the total number of behaviors on the checklist and then multiplying by 100 to obtain a percentage. A summative report of the findings is provided in Table 14. Although the specific items on the implementation fidelity form were different slightly for each dyad to accommodate changes made to address child and sibling differences, the primary training behaviors and content expected to be provided by the trainer/researcher were the same. The items included: (a)

reviewing the previous skills that the sibling had learned (only for step 2 and step 3), (b) providing a definition of each step, (c) asking to the sibling to verbally rehearse the definition, (d) providing hints or prompts to help the sibling's responses, (e) providing a 'cue card' to help the sibling's understanding, (f) providing example(s) of play situations or play skills, (g) providing a model of the skills and strategies, and (h) providing chance(s) for practice. All of the listed behaviors except providing a 'cue card' for helping the siblings' understanding were rated as completed 100% of the time. The provision of the cue cards was rated as completed 86% of the time. This rating occurred because the researcher made the decision not to provide the cue card to Libby because it was clear from her performance that they were not needed for Libby.

Social Validity

Participant perspective of the intervention. Following the intervention without coaching phase, as previously described each family (i.e., parents and siblings) was asked to complete a questionnaire, which included questions about their overall experiences of participating in this study. All three parents reported that they agreed or strongly agreed that overall the intervention was appropriate and important for their children and family (one parent strongly agreed and the other two parents agreed), the intervention training procedures were easy for their children and them to follow (one parent strongly agreed and the other two parents agreed), and they felt they would be able to teach the skills and strategies with the provided written notes in the future (one parent strongly agreed and the other two parents agreed). All three parents also agreed or strongly agreed that the intervention was helpful for their older child's interaction with her sibling with a disability (two parents strongly agreed and the other parent agreed). However, one parent strongly agreed and another parent agreed that the intervention was helpful for their child with a disability to interact with his or her sibling and

others such as peers and teachers while another parent reported 'neutral' about that. All three parents reported that they agreed or strongly agreed that their children enjoyed participating in the intervention (one parent strongly agreed and the other two parents agreed) while two parents strongly agreed that they themselves enjoyed participating in the intervention. The other parent felt neutral about her participation in the intervention because she felt that the level of parent involvement expected was more extensive than she had expected. This parent additionally commented that her goal is that her children social interact and play together without requiring parental involvement and support, which would seem a more typical situation.

In addressing any challenges that the parents themselves or their children experienced as they participated in the intervention, one parent reported that she felt that the study took relatively long and thus it was difficult for her family to continue to schedule sessions particularly once school started. The other two parents reported that the biggest challenge they faced was what to do when their typically developing child (i.e., the sibling) was having a bad day either because they weren't feeling well or were in a bad mood which then would result in their not wanting to play with their sibling with a disability. One parent reported that although it was often difficult to get the sibling to focus on interacting with her brother, she improved greatly over time because of what she learned in the intervention.

All three siblings also agreed to participate in the sibling questionnaire. Two of the siblings reported that they enjoyed the training and the other sibling reported that she does not know about that. Two siblings reported that they found the training easy to do while the other sibling did not feel the training was easy to do. All three siblings reported that they believe that they will use the skills and strategies they learned in the future and also found that these skills are helpful in playing with their sibling with a disability. Two siblings reported that they felt that the

skills they learned help them in general playing with their sibling with a disability while the other sibling reported that she does not know about that. Finally, two siblings reported that overall they did not experience any specific difficulties throughout the intervention. The one sibling who had reported as noted above that she did not feel the training was easy to do again responded that she felt that there were many things she found difficult to do.

Independent assessment of socially valid changes. In order to identify the significant difference between the baseline and the intervention phase, six early childhood professionals (i.e., doctoral students in special education) viewed selected videotape segments, one from the baseline phase and one from late in the intervention phase, of each sibling and child dyad and provided their feedback for each segment separately on the interactions of the two children using a 5 point likert rating scale questionnaire as described previously in the methods section. A summary of the results is presented in Table 15.

For the Peyton/Gary dyad, the overall mean rating across all 5 items and all 6 raters was 1.5 (i.e., between very low and low) for the baseline video segment and 4.14 for the intervention video segment. For the Terry/Sam dyad, the overall mean rating across all 5 items and 6 raters for the baseline clip was 2.57 (i.e., between low and neutral) and 4.54 (i.e., between high and very high) for the intervention video segment. For the Libby/Penny dyad, the overall mean rating for the baseline clip was 2.27 and for the intervention clip was 3.86. Thus the overall mean rating difference between the baseline and intervention video segments for each dyad was: Peyton/Gary dyad (2.64), Terry/Sam dyad (1.97), and Libby/Penny dyad (1.59).

The greatest change for the Peyton/Gary dyad after the intervention was the degree to which the sibling actively initiated the joint play activity (i.e., 3.24 difference between the baseline and intervention video segments) and then second largest change was the degree to

which the sibling actively maintained the joint play activity (i.e., 3.1). The greatest change for the Terry/Sam dyad after the intervention was the degree to which the sibling appropriately scaffolds the child's play behavior to facilitate more sophisticated and appropriate joint play (i.e., 2.43 difference in rating between the baseline and intervention video segments) and then second largest change was the degree to which the sibling actively maintained the joint play activity (i.e., 2.19). Finally, the greatest change for the Libby/Penny dyad after the intervention was the degree to which the sibling actively maintained the joint play activity (i.e., 1.83 difference rating) and then second largest change was the level of positive social interactions between the children (i.e., 1.67). Thus, the item on the rating scale in which the greatest change of social behavior across the sibling and child dyads was noted by the raters was the degree to which the sibling actively maintained the joint play activity (i.e., all three sibling and child dyads were rated as having the greatest or second greatest change on this item).

Discussion

This study investigated the impact of sibling-implemented intervention designed for improving social interaction skills of preschool-aged children with disabilities who are socially withdrawn through sibling training of specific social skills or strategies. Answers to the following three research questions were sought: (a) Does sibling-implemented intervention promote typically developing siblings' play related social interactions with their siblings with disabilities? (b) Does sibling-implemented intervention promote children with disabilities' total social interactions with their siblings? and (c) Does the sibling-implemented intervention result in socially valid changes in the children's play related social interactions? The discussion of the study into the following sections is also presented: (a) summary of the findings, (b) limitations of the study, and (c) implications for future research and practice.

Summary of the Findings

The purpose of this study was to assess the effectiveness of sibling-implemented intervention for improving social interaction skills of young children (i.e., 3 to 5 year olds) with disabilities. A three step training sequence (i.e., Step1-*Stay*, Step 2-*Stay and Play*, and Step 3-*Stay, Play, and Talk*) with additional social interaction and play engagement strategy training were included in the sibling-implemented intervention package. A multiple baseline across participants was replicated across three sibling and child dyads. Results of the study indicate that the sibling-implemented intervention training promoted the siblings' play-related social interactions with their siblings with disabilities. That is, the siblings could learn and use some specific social skills and strategies in interacting with their siblings with disabilities during play. Furthermore, the sibling-implemented intervention training promoted the children with disabilities' total social interactions with their siblings. The results presented support the statement that all three siblings used the social interaction initiation behaviors at higher levels after the intervention than during the baseline. Although the siblings' uses of inappropriate behaviors were at relatively low levels even during the baseline, the results demonstrated that the siblings' low levels maintained or in some cases were lower after the intervention than during the baseline. The increase in social interaction initiations by the siblings to the child with a disability and the slightly lower levels of already low levels of inappropriate behaviors on the part of the siblings provides support for the statement that the interactions between the children became more positive after the intervention. The social validity ratings by independent raters and the participants provides further verification that changes in sibling and child play related social interaction were meaningful and important changes.

While positive changes were noted for all of the sibling/child dyads, each sibling and child presented certain learning characteristics and unique needs that impacted modifications or adaptations that were needed during the training/intervention phase. For the Peyton/Gary dyad, it was challenging to teach Peyton (i.e., the sibling) to initiate and maintain play with Gary because she did not like to share materials, follow Gary's interests, and to facilitate Gary's play behaviors. These issues were challenges for her generally in other contexts primarily due to her difficulties in maintaining focus and engagement which were related to her diagnosis of ADHD. Furthermore, Gary was used to ignoring Peyton's typical initiation strategy of calling out his name and thus Peyton frequently would express frustration with Gary because he would not respond to her. During the intervention phase, the researcher provided Peyton very specific instructions of how to approach Gary and gain his attention. For example, the researcher taught Peyton to call Gary's name and pause 2-to-3 seconds and then call his name again if he did not respond rather than calling Gary's name several times in rapid succession. The researcher also taught Peyton to make sure that she was in physical proximity to Gary and made eye contact with Gary as she called his name. Peyton was shown how these strategies would help Gary to recognize that Peyton was paying attention to him and attempting to initiation play with him. In addition, the researcher frequently reminded Peyton of how to follow Gary's interests rather than insisting that he join in her play. Gary used inappropriate behaviors at higher levels after the intervention than during the baseline but this happened because he was not responding to or ignoring his sister's play related social interaction initiations which dramatically increased after the intervention training. Nonetheless, given that Gary's play engagement and social interaction with Peyton increased after the intervention, the quality of Gary's social interactions is considered to have improved after the intervention. Gary had great difficulties in paying attention

to an activity even with Peyton's continuous attempts to initiate play with him. However, when Peyton would play with one of Gary's favorite toys or materials and then ask him to join the play, Gary began to show interest and joined in the play. Although Gary's overall play engagement and social interactions was at relatively low level compared with the other two children, his play engagement and social interactions did improve as a function of the intervention.

For Terry and Sam, Terry already had relatively good social interaction skills when she played with her brother. Moreover, since Terry's mother sometimes was involved in her children's play and directly facilitated their play during the baseline phase, Terry and Sam's social interactions were at relatively high levels during the baseline phase. Therefore, Terry demonstrated relatively small differences in her social interaction behaviors between the baseline and the intervention phases as compared to the other two siblings. Similarly, Sam demonstrated relatively high levels of social interaction behaviors during the baseline phase. Even so, Sam's response rate and consistency of responding to initiations of social interaction behaviors from his sibling increased following the intervention. Sam used inappropriate behaviors at lower levels after the intervention than during the baseline indicating that the positive nature of the social interaction between the sibling dyad improved.

For Libby and Penny, although Libby frequently played together with her sister, Libby's primary strategy was to show Penny toys or other play materials and then play on her own in front of Penny rather than sharing the materials and interacting with Penny. Therefore, the primary focus of the intervention for Libby was on having her learn how to share materials with Penny and how to support Penny's active participation in the play activities. Libby sometimes refused to play with Penny using learned social skills because she said that she felt she was working rather than playing with her. Thus, the researcher decided to give Libby a break from

the “intervention and training,” stopped the current session and then told Libby at the beginning of the following session that she could do the play session any way she wanted in the following session. Following this brief two session “break, Libby on her own began using the social skills she had learned from the researcher during training and practice play sessions. Due to Penny’s physical and movement limitations, Penny required modifications in that she would demonstrate her response to a play related social initiation from her sibling. For example, if Penny looked at Libby or carefully observed Libby’s play behaviors that Libby was showing her, the behavior was considered a social response behavior. Penny’s response to initiations of social interaction behaviors from her sister were at high levels after the intervention as her sister presented more meaningful initiations of social interaction behaviors after the intervention. Penny did not display any of inappropriate behaviors across all of the phases. However, given that Penny’s social response behaviors increased and further Libby’s inappropriate behaviors decreased after the intervention, we can assume that Penny changed positively in play engagements and social interactions after the intervention.

Given that this study was implemented in the families’ homes and embedded into their busy family schedules, some unexpected situations occurred. For example, as previously noted from parents’ reports, siblings sometimes lost their motivation or interest in interacting with their siblings with disabilities because they did not feel well or were in a bad mood. In those cases, the researcher shortened or skipped the session and rather spent time with the sibling asking about their interests thus showing respect for the sibling’s feelings. Maintaining good rapport with the sibling was a critical element for the successful implementation of the study. The researcher also needed to implement the sibling training such that it appropriately matched each individual sibling’s chronological age, needs, and level of understanding. For example, Peyton had a

relatively short attention span and thus the researcher scheduled short session in the beginning and then gradually increased the length of the sessions as Peyton became more comfortable and confident. Peyton also frequently expressed frustration for initiating or maintaining play with Gary, the researcher provided lots of praise and encouragement to keep up her confidence. Finally, as noted earlier, one parent reported that she felt her level of required involvement was greater than she expected and the length of the study was too long for her family. Clearly, the researcher needed to have done a better job of communicating with the family regarding the role of the parent and the anticipated length of the study before beginning the study and as the study continued.

Limitations of the Study

Several limitations are noted although the study provides important information about the effectiveness of the sibling-implemented intervention. First, multiple maintenance attempts for each sibling and child dyad were not possible due to unexpected delays in data collection. Particularly, for the second dyad, as the children's school started, their schedule was very tight and thus it was hard to make schedules additional maintenance data collection sessions. It was anticipated that all data collection including maintenance could be conducted over the course of the summer, however timeline became longer than anticipated.

A second limitation to the study is related to selecting participants. Given numerous barriers to identifying and recruiting families who could accommodate the requirements of the research study into their already busy schedule, it was impossible to select participants based on those who could most benefits from the intervention. For example, for the second dyad (i.e., Terry and Sam), since the sibling already had relatively good social interaction skills before the intervention, the family reported not feeling that they received substantial benefit from the

intervention. In Penny's case, due to her physical movement limitations, the types of social interactions in which Libby and Penny engaged were very different from those of the other children. Libby was more likely to physically assist Penny to engage in play rather than initiate social interactions such that they could play together. Thus, Libby reported that she found playing with Penny to be "work" rather than play and not really fun.

Another limitation in terms of the participants recruited for participation was the fact that they were relatively homogeneous given that all participants were Caucasian, two parent families, and all siblings were female. The demographic characteristics of the participant families, thus, limit the generalization of the findings to other groups. For example, families representing other ethnically, culturally and/or linguistically backgrounds might well respond differently to the intervention. Furthermore, male siblings might require modifications in the intervention approach. Additional research is needed that includes participants from diverse demographic information in terms of gender, cultural, and linguistic background.

A final limitation to this study is a lack of information regarding the quality of the children's social interactions during their play. The findings of children's social interaction behaviors and inappropriate behaviors across the phases and the findings of social validity from parents, siblings, and other raters who were naïve to the intervention provides some information about change in the quality of the children's social interactions following intervention. However, more comprehensive information and direct assessment of changes in quality would have strengthened our understanding.

Implications for Research

The sibling training of social skills and strategies resulted in positive outcomes for both the siblings and the children with disabilities and thus the sibling-implemented intervention

offers some contributions to the literature. First, to date only a small number of research studies have been reported in which siblings of young children with disabilities have served as intervention agents in supporting children with disability's learning of social interaction skills in their natural contexts. Rather, previous studies have primarily trained the peers of young children with disabilities as a means for improving young children with disabilities' social interaction skills in classroom settings. However, the findings of this study provide support for the likelihood that siblings can play an important role in improving their siblings with disabilities' social interaction skills by learning and applying social interactions strategies which help then as they play with their siblings with disabilities and in turn enhance their siblings play related social interaction responses.

Second, this study included children who have relatively diverse characteristics and types of disabilities. That is, the study included not only children with autism but also a child with physically severe disabilities. The majority of the previous studies have targeted children with autism for promoting their social skills because children with autism are typically known to be socially isolated or withdrawn. However, in fact, most of children with disabilities regardless of the type of disability have been reported as having issues with social isolation or withdrawn personalities due to their lack of social skills or physical limitations (Freeman & Kasari, 1998; Guralnick, et al., 2006; Janney & Snell, 2006; McConnell, 2002; McConnell & Ostrosky, 2008; Odom et al., 1999). Thus, by including a child with a variety of disabilities other than children with autism, this study provided some useful information of the types of modifications that are needed in the intervention approach and content to appropriately meet the needs of the children with disabilities. In addition, the siblings were not all typically developing children with one sibling having a diagnosis of ADHD. In spite of her own special needs, that is, attention and

some behavior challenges, she was able to learn to be an effective play partner for her sibling with disability. In fact, the sibling herself improved her own social interaction skills during plays after participating in the training. The results from the social validity ratings regarding the significance of the change of the play between this sibling pair provided support for meaningful change. In fact, this sibling's social interaction behaviors were rated to improve at the highest level across the three siblings. Her father also expressed satisfactions regarding his daughter's improvements in her social interaction skills leading to positive impacts for his child with a disability's play.

Another worthy aspect of the study is incorporating the assessment of social validity from the other raters who were naïve to the intervention as well as the participants. As noted earlier, Kennedy (2005) and Wolf (1978) suggested the need to report the social importance of intervention effects, appropriateness of the procedures, and/or satisfaction of the participants. Furthermore, Horner and colleagues (2005) emphasized the importance of the assessment of social validity as a critical feature of high-quality single-subject design studies.

Implications for Practice

This study also offers some implications for practice. At the initial meeting, all of the parents were provided with written instruction specifically describing the components of the intervention and training procedures. Each parent then had the written instructions available to them as they observed the intervention and training as the researcher worked with the siblings. Several of the parents reported having learned some specific tips and strategies that they could and had used at other times with their children. Thus, professionals working with young children with disabilities should consider using the intervention and training procedures as a tool for supporting families to implement in their homes with their children. This is particularly relevant

given that parents spend large amounts of time with their children in their daily routines, have a very comprehensive knowledge of both of their children's learning characteristics and social skills and thus would likely have a higher probability for achieving positive outcomes from implementing the intervention.

The ultimate goal for children with disabilities is developing age-appropriate social interaction skills and thus increasing the opportunities for positive interactions with their peers in additional contexts such as community and educational settings. Therefore, it would be very useful for the family to share the training and outcomes of the intervention with teachers and other professionals who work with their child with a disability. Teachers and other professionals can also implement a modified training by teaching the skills and strategies to some of the typically developing children in classroom who would be appropriate play partners for the children with disabilities.

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Table 1
Sibling and Child Demographics

Sibling	Dyad	Age	Gender	Race/Ethnicity	Grade in School
Peyton	1	8yr. 5mos.	Girl	Caucasian	Second grade
Terry	2	7 yr. 8mos.	Girl	Caucasian	First grade
Libby	3	6 yr. 8mos.	Girl	Caucasian	Kindergarten

Child	Dyad	Age	Gender	Preschool Setting	Diagnosis	Current ECSE Services
Gary	1	5 yr. 6mos.	Boy	Special education inclusive class	Autism	Speech/language therapy
Sam	2	5 yr. 3mos.	Boy	Inclusive class of public school	Autism	OT, speech/language therapy
Penny	3	3 yr. 8mos.	Girl	Special education inclusive class	Developmental delay and other multiple disabilities	OT, PT, speech/language therapy

Table 2
Definition of Each Step

Step	Definition
Stay	Sibling moves to the child where she or he is playing in order to join the child's play, stays in proximity, looks at the child, and gets the child's attention.
Stay and Play	After sibling gets the child's attention, the sibling finds a way to start or join in play together with the child.
Stay, Play, and Talk	Sibling describes play or something related to toys and/or suggests play skills to the child for continuing playing together with the child.

Table 3
Step 1-Stay: Sequence

	Script
Researcher:	"When you want to play with your friends, you need to be with them, which we will call it 'stay'." "Stay means that you move to the child…" "Now, can you tell me what would you do for stay?"
Sibling:	"Move to where the child is playing."
Researcher:	"That's right. Now, let's suppose that you see (child's name) playing with a puzzle in the living room and you are in the kitchen, what do you think you should do?"
Sibling:	"I move to the living room where (name) is playing with the puzzle."
Researcher:	"Great, when you move to the child, what would you do next?" (if the sibling does not respond, wait 3 sec. and provide a hint)
Sibling:	"Look at …"
Researcher:	"Right. Now, let's think about what you would do after you stay with (name). Although you stay with (name), he/she may not look at you. So, you may need to get the child's attention. In this case, what kind of things do you think would be good to say to (name) for getting his/her attention?"
Sibling:	"Hi" "Call (child's) name."
Researcher:	"That's right. You did a great job. Here, let's look at a cue card I have that can help you remember these steps." "Hi" Touching/ Smiling Naming "What are you doing?"/ "You are doing puzzle." "That looks like fun."/ "I like it." "Let's practice with this card." Provide a model for each strategy.
Sibling:	Read and observe the model provided by the researcher. Then, practice with the researcher. (Researcher will play the child's role)

*Note: a. If the sibling does not respond, the researcher will wait 5 sec. and then re-ask a question with prompts.
b. If the sibling continues not to respond to the researcher's question, the researcher will provide the answer and then re-ask the question.
c. If the sibling has some difficulties with practice, the researcher will provide a model.

Table 4
Step 2-Stay and Play: Sequence

	Script
Researcher:	"Do you remember what you need to do for *Stay*? Tell me what you would do for *Stay*."
Sibling:	"Move to where (name) is playing, then look at (name) and then say 'hi' or call his/her name to get his/her attention."
Researcher:	"That's right. You remembered. Now, let's think about what you would do to play with (name). After you stay with (name) and get his/her attention, what would you do to join in play with (name)?"
Sibling:	"Asking, 'can I play with you?' or ..."
Researcher:	"Very nice. When you want to join in the play, you need to ask if you can play. Now, let's look at this cue card." Ask to play with (name) ("Can I play with you?") Bring a toy over/Put a toy in their hand Share/ Use the same toy Take turns Ask to help ("Do you need some help?"/ "I can help you.") "Let's practice with this card." Provide a model for each strategy.
Sibling:	Read and observe the model provided by the researcher. Then, practice with the researcher.
Researcher:	"Very nice." Now, I will tell you some tips in the case (name) does not answer or respond to you even though you asked to join in the play." ☞*See Table 5 (i.e., 'Sharing' and 'Requesting to share')*.

*Note: a. If the sibling does not respond, the researcher will wait 5 sec. and then re-ask a question with prompts.
b. If the sibling continues not to respond to the researcher's question, the researcher will provide the answer and then re-ask the question.
c. If the sibling has some difficulties with practice, the researcher will provide a model.

Table 5
Step 3-Stay, Play, and Talk: Sequence

	Script
Researcher:	"Do you remember what you need to do for *Stay*? Tell me what you are doing for *Stay*."
Sibling:	"Move to (name) where … is playing, then look at (name) and then say 'hi' or call his/her name to get his/her attention."
Researcher:	"That's right. Good job. Now, can you tell me what you are doing for *Stay and Play*?"
Sibling:	"I will ask to (name), 'can I play with you' or 'can I share the toy with you?' etc."
Researcher:	"You are doing a very nice job. Do you remember the tips that I let you know in the case that (name) does not answer or respond to you even though you asked to join in the play?
Sibling:	"I need to touch his shoulder and ask to (name) again if I can play with (name)." or "I need to wait for a few seconds and ask again."
Researcher:	"Great! Now, we are going to talk about how you can continue playing with (name). While you play with (name), he/she can lose his/her interest in the toy or play because he/she does not know how to play with the toy or how to extend the play. So, if you help (name)'s play, you can continue play with the child. Suppose that you and (name) start to play together with a puzzle. (name) picks up a puzzle piece but he does not put it in the right place. What would you do in this case?"
Sibling:	"I will help him so that he knows how to do that."
Researcher:	"That's right. You can show him how to match each piece of the puzzle into the right place. For example, you can point where the piece of the puzzle should go or you can hold his hand to put the puzzle in the right place." "Now, let's think about another situation. …" (Provide several different play examples)
Sibling:	Think about another situation and respond to the researcher's question.
Researcher:	"Now, let's see this card." ☞*See Table 5 (i.e., 'Offering help', 'Suggesting play skills', 'Play organizing', 'Compliment')*. Provide a model for each strategy. "Let's practice together."
Sibling:	Read and observe the model provided by the researcher. Then practice with the researcher.

*Note: a. If the sibling does not respond, the researcher will wait 5 sec. and then re-ask a question with prompts.
b. If the sibling continues not to respond to the researcher's question, the researcher will provide the answer and then re-ask the question.
c. If the sibling has some difficulties with practice, the researcher will provide a model.

Table 6
Social Strategies for Step 2 and 3

Strategies	Description	Examples	Tips for use
Sharing	Giving a toy or material to the other child	"Here, ..." giving a toy over or put a toy in ... hand	If the target child drops or throws the toy, or even walks away, it does not mean that the child does not want to play. Try again! - Drops or throws: Pick it up and ask in another way, "Here, (name) You have a red car. You like it?" "Do you want another? How about a blue car?" - Walks away: Touching shoulder or arm, saying "Hey, here it is. Let's play with me." Etc.
Requesting to share	Asking for a toy	"Can you give me a car?" "Can I get the red car?" Holding out your hand, "... give me a car, please"	If the target child does not respond or does not want to give what siblings asked, ask him/her again! Show him/her you need something by holding your hand out and say "thank you" when he shares. - Wait a few seconds and ask again, "(name) Can I have the red car, please?" - Touching and ask him again.
Offering help	Asking if the child needs help or offer physical or verbal help	"Do you want me to help you?" "Can I help you?" Holding the target child's hand over the toy, "I can help you. Here..."	If the target child does not respond, wait a few seconds and say that again. If the target child tries to walk away, touch his shoulder or arm and say that again.
Play organizing	Provide ideas that can have extended play	"Let's play with a parking garage." "I will be a taxi driver and you will be a ..." "You can make a castle with the blocks"	When the target child does not feel interested in the play, suggest ideas that help extend the play. If the child does not respond or tries to leave, bring a new toy that is related to the play and ask him/her again. Or show him/her how to play in new settings or with new materials.
Compliment	Provide praises and encouragements	Say nice things, "Good job" "That is great!" "How nice" "I like it" Give them a high five. Pat them on the shoulder with smiling.	Provides these praises and/or encouragements as much as you can.

Table 7

Sibling and Child Practice with Coaching from Adults

Role	Description
Researcher	- Ask the sibling and parent to choose a toy for the practice. - Set up as natural play setting as possible. - Ask the parent of the children to help her child with a disability to participate in the practice sessions (providing prompts). - Ask the sibling to practice with the child. - Ask the sibling to use several different strategies to the child for each step (i.e., *Stay*, *Stay and Play*, *Stay, Play, and Talk*). - Provide verbal prompts if the sibling does not initiate within 10 sec. or does inappropriately. - Provide "cue cards" if the sibling continues to have difficulties in using the learned strategies. - Provide praises and/or feedbacks each time the sibling practices with the child.
Sibling	- Use the strategies that the sibling learned in each step (i.e., *Stay*, *Stay and Play*, *Stay, Play, and Talk*). - Practice several times by using different strategies that the sibling learned in each step (i.e., *Stay*, *Stay and Play*, *Stay, Play, and Talk*).
Parent	- Provide prompts if the child does not respond to the sibling or tries to leave the play. - Provide help if the child displays tantrum or other negative behaviors.

Table 8

Play Session: Role of the Researcher, the Children, and their Parent

Role	Script
Researcher	(a) The researcher will explain the play session to the children and their parent as follows: - *To the parent*, "In this session, we will not involve in children's play. We will observe their play for about ten minutes to see how they interact with each other during the play session. I am going to set up a video camera where would be as less intrusive for their play as possible. Then, I will record their interactions for checking if the training is effective for your children's interaction. If (name of the child) displays a serious tantrum or other negative behaviors so that the play cannot be continued, I will ask you to go to the play and help (name of the child) to go back to the play. Do you have any question?" - *To the sibling and the child*, "Now, (name of the sibling) and (name of the child) will play together as you did last time. This time, however, your mom and I will not give you any help, praise, or others. We will simply observe you quietly backside. And I am going to set up a video-camera to record your play. So, just play together with toys as usual. Do you have any question?" - *To the sibling*, "(name of the sibling), do you remember the skills and strategies that you learned from the training? Don't forget to use them while playing with (name of the child). Just play with (name of the child) as you did last time. If (name of the child) displays a serious tantrum or leaves the play so you cannot continue play with (name of the child), your mom will come to your play to give some helps." (b) Set up video equipment for recording. (c) Ask the sibling to play with the child. (d) Videotape and observe the interactions between the sibling and the child.
Sibling & child	(a) Listen to the explanation of the researcher. (b) Choose a toy that the sibling and the child prefer. (c) Play with the choosing toy with the child for approximately 10 min.
Parent	(a) Listen to the explanation of the researcher. (b) Observe their children's play. (c) Provide helps if the play cannot be continued due to her child's negative behaviors or leaving the play.

Table 9
Sibling and Child Social Behaviors

Sibling and child social interaction behaviors		
	Definitions	Examples
Social initiations	Motor or verbal behaviors clearly directed to a sibling/target child that attempted to evoke a social response or social exchange. These behaviors should be sustained for at least 5 sec. and directly related to the play activity.	Greetings, naming, touching for attracting an attention, handing materials to another, asking and answering questions, sharing materials, requesting an action or turn, commenting on anything related to play activity, helping
Social responses	Motor or verbal behaviors that acknowledged a reply to the initiation within 3 or 5 sec. and sustained these behaviors for 5 sec. These behaviors should be directly related to the play activity.	Looking in response to any initial behavior (Keep looking at a material or person without any social exchange is not included although looking behavior is sustained), responding, nodding, following a direction or request, answering a question or a comment, turn taking

Sibling/Child inappropriate social behaviors		
	Definitions	Examples
Inappropriate social behaviors	Any inappropriate or disruptive/harmful motor or vocal behavior	Leaving the play activity, no eye-contact, no answering, no responding to any initiation or response of the other, pushing, hitting, throwing a material, kicking, biting, shaking body or face of the child/sibling, screaming, crying

*Note: (a) Non play-related social behaviors

- Any behaviors or comments that are included the above examples but are not directly related to the play activity.
- Examples of behaviors or comments that are not directly related to the play activity: Hugging, kissing, or talking with the other while holding the toy or material, any other behaviors or comments that are not on the purpose of asking to or getting attention from the sibling or child.

(b) For a child who is not able to move like the other children, eye contact, smiling at, or looking at the sibling's plays or behaviors is included as 'social response' if these behaviors are sustained for at least 5 sec. These behaviors should be related to the sibling's play activity or play behaviors.

Table 10
Summative Report of Sibling Social Interaction Behaviors

Sibling		Peyton	Terry	Libby
Baseline Mean % (Range)	Total social behaviors	18.5 (8-37)	51.5 (37-78)	39.56 (18-68)
	Play-related social behaviors	16.25 (7-37)	25.5 (0-60)	33.33 (17-67)
	Inappropriate behaviors	0.75 (0-3)	2.75 (0-17)	2.11 (0-13)
Intervention w/ coaching Mean% (Range)	Total social behaviors	56.5 (13-90)	74 (73-75)	82 (76-88)
	Play-related social behaviors	56.5 (13-90)	66.5 (65-68)	71.5 (67-76)
	Inappropriate behaviors	0	0	0
Non-coaching Intervention Mean% (Range)	Total social behaviors	58.67 (46-78)	73.8 (57-90)	85 (79-90)
	Play-related social behaviors	56.1 (37-72)	61.4 (47-80)	79.5 (75-85)
	Inappropriate behaviors	1.78 (0-5)	0	0
Maintenance Mean% (Range)	Total social behaviors	82 (79-85)	79	67 (55-79)
	Play-related social behaviors	78.5 (77-80)	76	63 (50-76)
	Inappropriate behaviors	0	0	0

Table 11
Summative Report of Child Social Interaction Behaviors

Child		Gary	Sam	Penny
Baseline Mean% (Range)	Total social behaviors	13.5 (0-30)	24.75 (3-66)	45.11 (17-62)
	Play-related social behaviors	10.75 (0-27)	11 (0-55)	23.44 (10-50)
	Inappropriate behaviors	8.5 (2-12)	7.75 (3-23)	0
Intervention w/ coaching Mean% (Range)	Total social behaviors	25.75 (10-50)	48 (45-51)	81 (74-88)
	Play-related social behaviors	16 (10-30)	44 (43-45)	66 (58-74)
	Inappropriate behaviors	39 (5-85)	4 (0-8)	0
Non-coaching Intervention Mean% (Range)	Total social behaviors	36.56 (13-68)	51.8 (29-88)	82.5 (74-93)
	Play-related social behaviors	31.33 (13-61)	30.6 (14-52)	74.5 (67-85)
	Inappropriate behaviors	21.56 (4-38)	6.4 (0-14)	0
Maintenance Mean% (Range)	Total social behaviors	50.5 (40-61)	73	55 (47-61)
	Play-related social behaviors	47 (35-59)	70	51 (43-59)
	Inappropriate behaviors	13.5 (7-20)	0	0

Table 12
Summative Report of Interobserver Agreement for Siblings

Sibling		Peyton	Terry	Libby
Baseline Mean % (Range)	Total social behaviors	98	84 (73-92)	77 (73-78)
	Play-related social behaviors	98	89 (83-92)	85 (80-92)
	Inappropriate behaviors	100	100	99
Intervention w/ coaching Mean%	Total social behaviors	84	70	74
	Play-related social behaviors	91	90	88
	Inappropriate behaviors	100	100	100
Non- coaching Intervention Mean% (Range)	Total social behaviors	89 (85-93)	76	83
	Play-related social behaviors	92.5 (92-93)	87	95
	Inappropriate behaviors	100	100	100
Maintenance Mean%	Total social behaviors	73	74	85
	Play-related social behaviors	89	82	95
	Inappropriate behaviors	100	100	100

Table 13
Summative Report of Interobserver Agreement for Children

Child		Gary	Sam	Penny
Baseline Mean% (Range)	Total social behaviors	92	85.5 (77-95)	84 (80-87)
	Play-related social behaviors	88	92 (88-97)	87 (80-93)
	Inappropriate behaviors	95	95 (88-97)	99 (98-100)
Intervention w/ coaching Mean%	Total social behaviors	77	57	71
	Play-related social behaviors	93	82	74
	Inappropriate behaviors	81	95	100
Non coaching Intervention Mean% (Range)	Total social behaviors	94 (93-95)	76	69
	Play-related social behaviors	94 (93-95)	81	83
	Inappropriate behaviors	77	92	100
Maintenance Mean%	Total social behaviors	80	85	82
	Play-related social behaviors	82	91	83
	Inappropriate behaviors	93	100	100

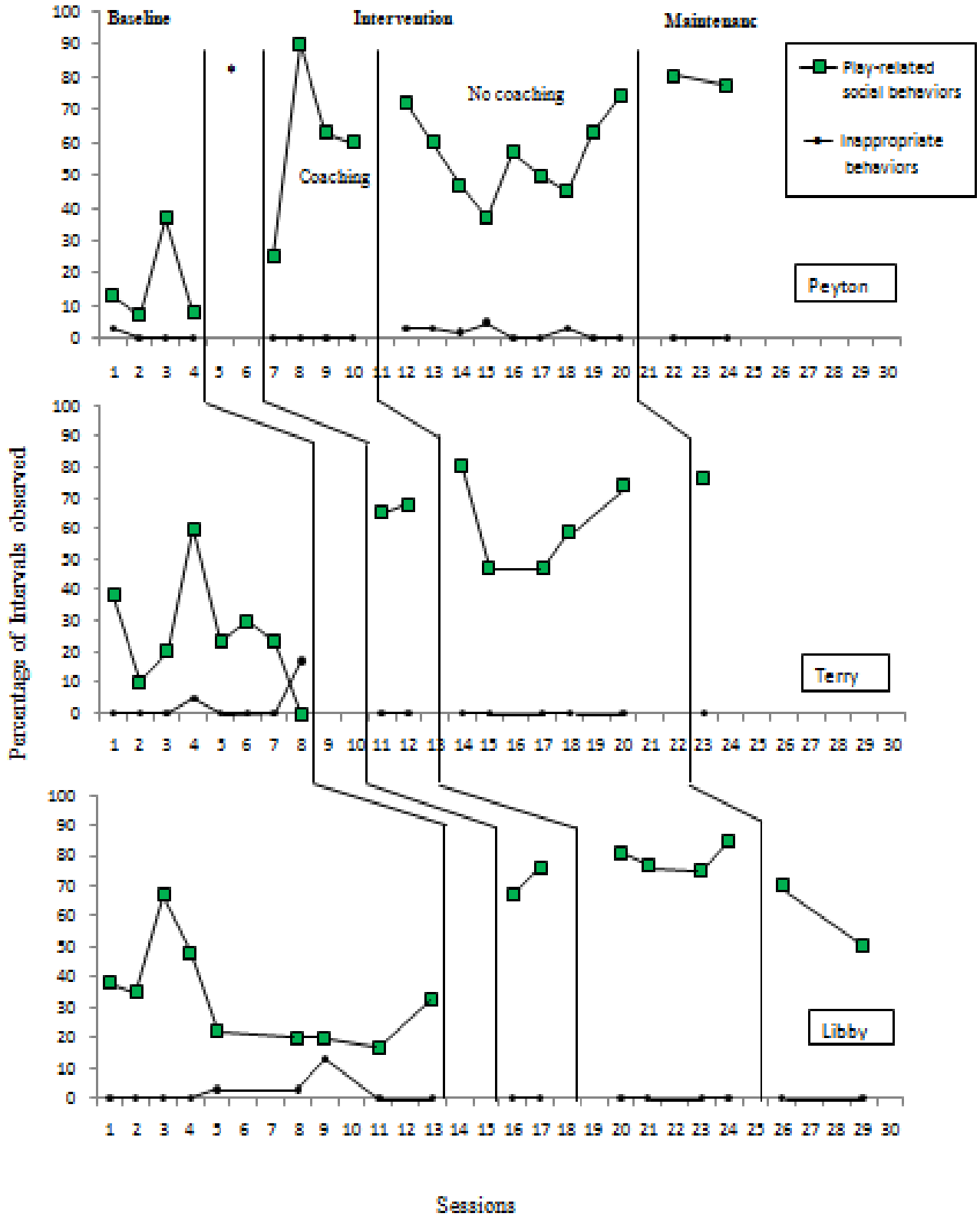
Table 14
Summative Report of Implementation Fidelity

List of Behaviors	Percentages	
	Yes	No
Review the previous skills that the sibling had learned	100%	0%
Provide a definition of each step	100%	0%
Ask to the sibling to verbally rehearse the definition	100%	0%
Provide hints or prompts to help the sibling's responses	100%	0%
Provide a 'cue card' to help the sibling's understanding	86%	14%
Provide example(s) of play situations or play skills	100%	0%
Provide a model of the skills and strategies	100%	0%
Provide chance(s) for practice	100%	0%

Table 15
Summative Report of Social Validity Using Video Segments

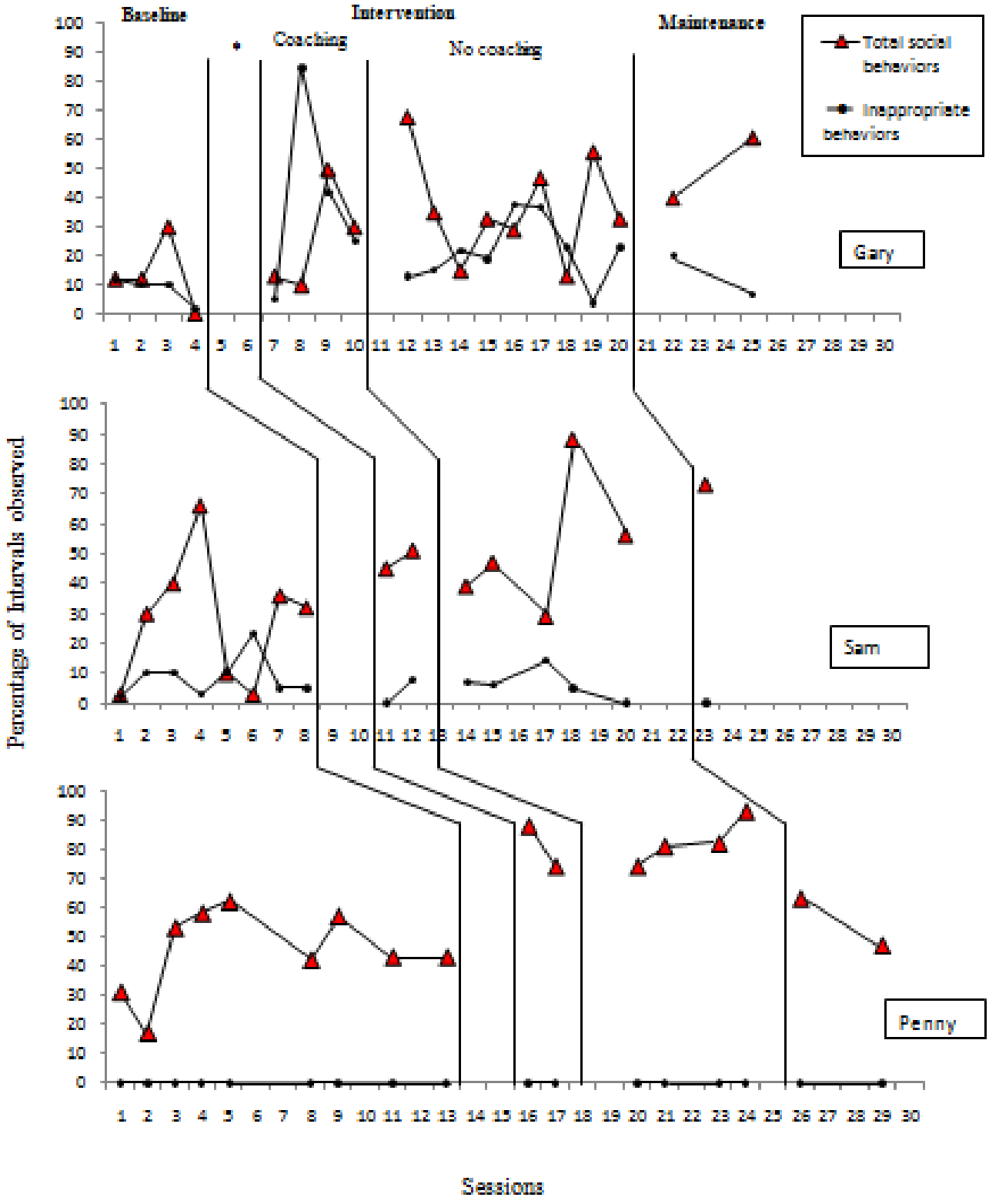
Questions	Mean Rating (range)					
	Dyad 1 (Peyton & Gary)		Dyad 2 (Terry & Sam)		Dyad 3 (Libby & Penny)	
	Baseline	Intervention	Baseline	Intervention	Baseline	Intervention
Rate the degree to which the sibling actively initiated the joint play activity.	1.33 (1-2)	4.57 (4-5)	2.67 (1-3)	4.43 (3-5)	2.67 (2-3)	4 (2-5)
Rate the degree to which the sibling actively maintained the joint play activity.	1.33 (1-2)	4.43 (3-5)	2.67 (2-3)	4.86 (4-5)	2.17 (2-3)	4 (2-5)
Rate the degree to which the sibling appropriately scaffolds the child's play behavior to facilitate more sophisticated and appropriate the joint play activity.	1.17 (1-2)	4 (3-5)	2 (1-3)	4.43 (3-5)	2 (1-3)	3.57 (1-5)
Using the scale, rate the level of enjoyment of the children demonstrated during their play.	1.67 (1-3)	3.57 (3-5)	2.83 (2-4)	4.57 (4-5)	2.17 (1-3)	3.71 (2-5)
Rate the level of positive social interactions between the children.	2 (1-4)	4.14 (3-5)	2.67 (1-4)	4.43 (3-5)	2.33 (1-4)	4 (2-5)

Figure 1- Siblings Social Interaction Behaviors



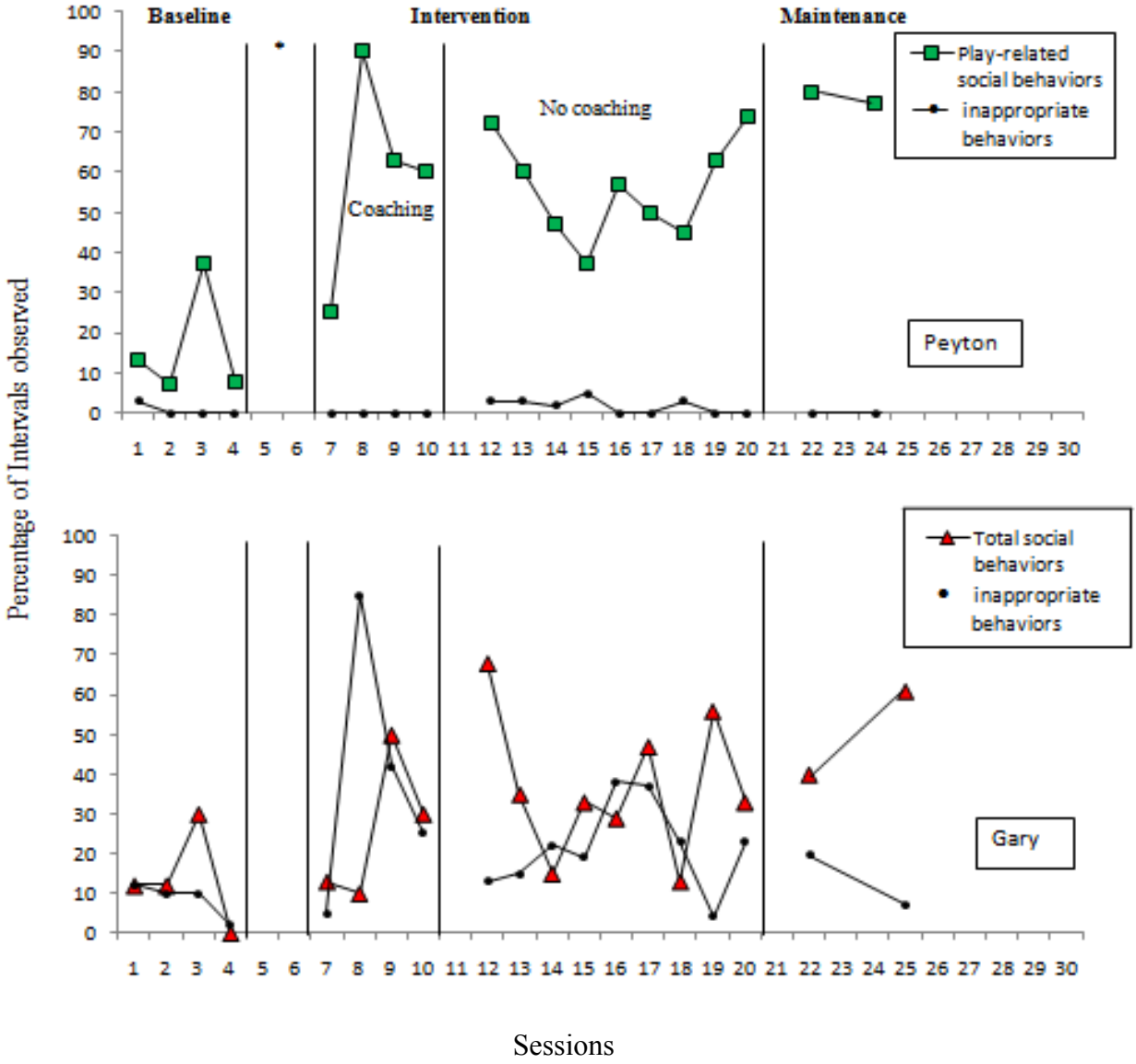
*Note: Training sessions without data collection between the baseline and the intervention

Figure 2 – Children Social Interaction Behaviors



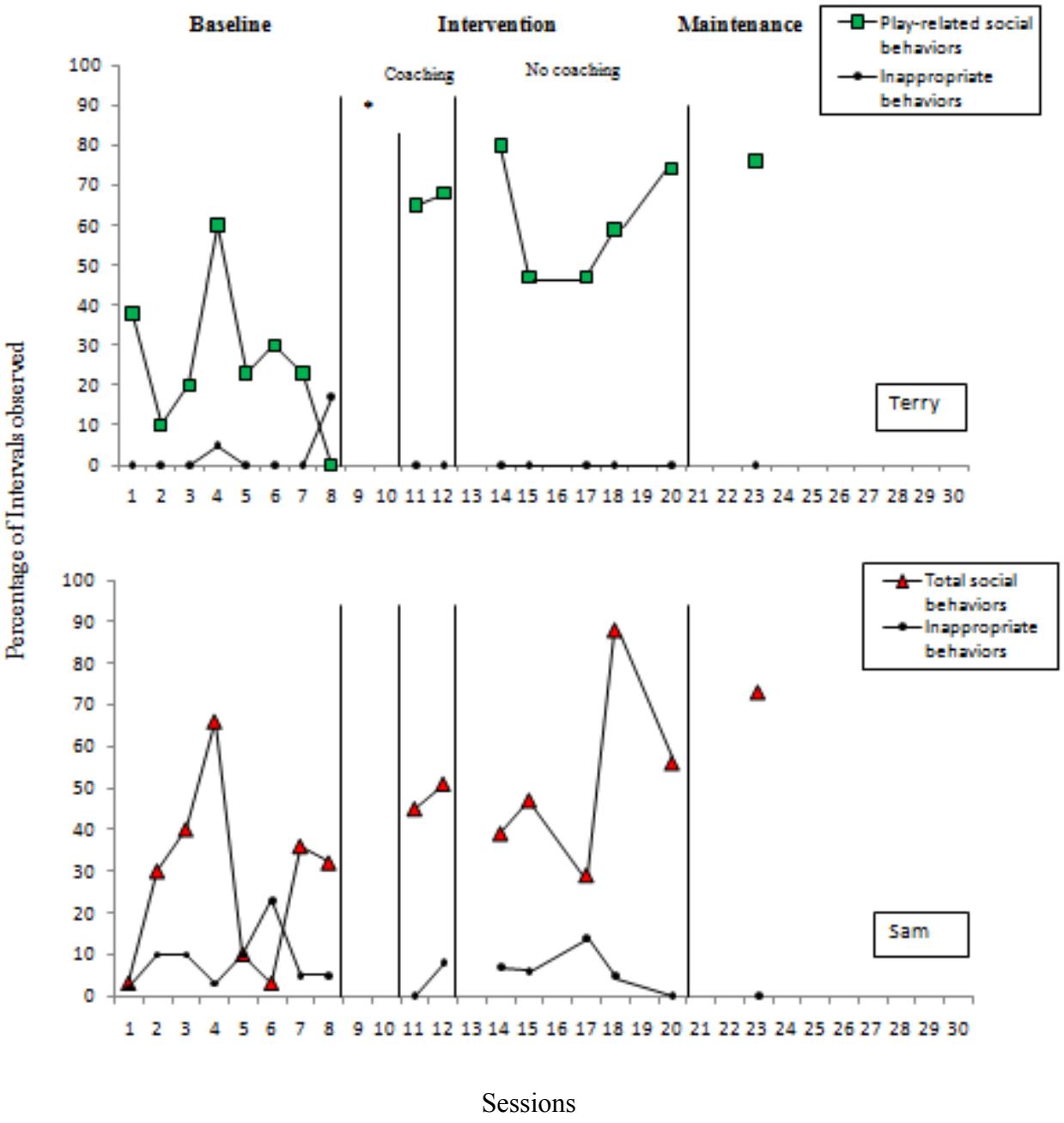
*Note: Training sessions without data collection between the baseline and the intervention

Figure 3 – Peyton & Gary's Social Interaction Behaviors



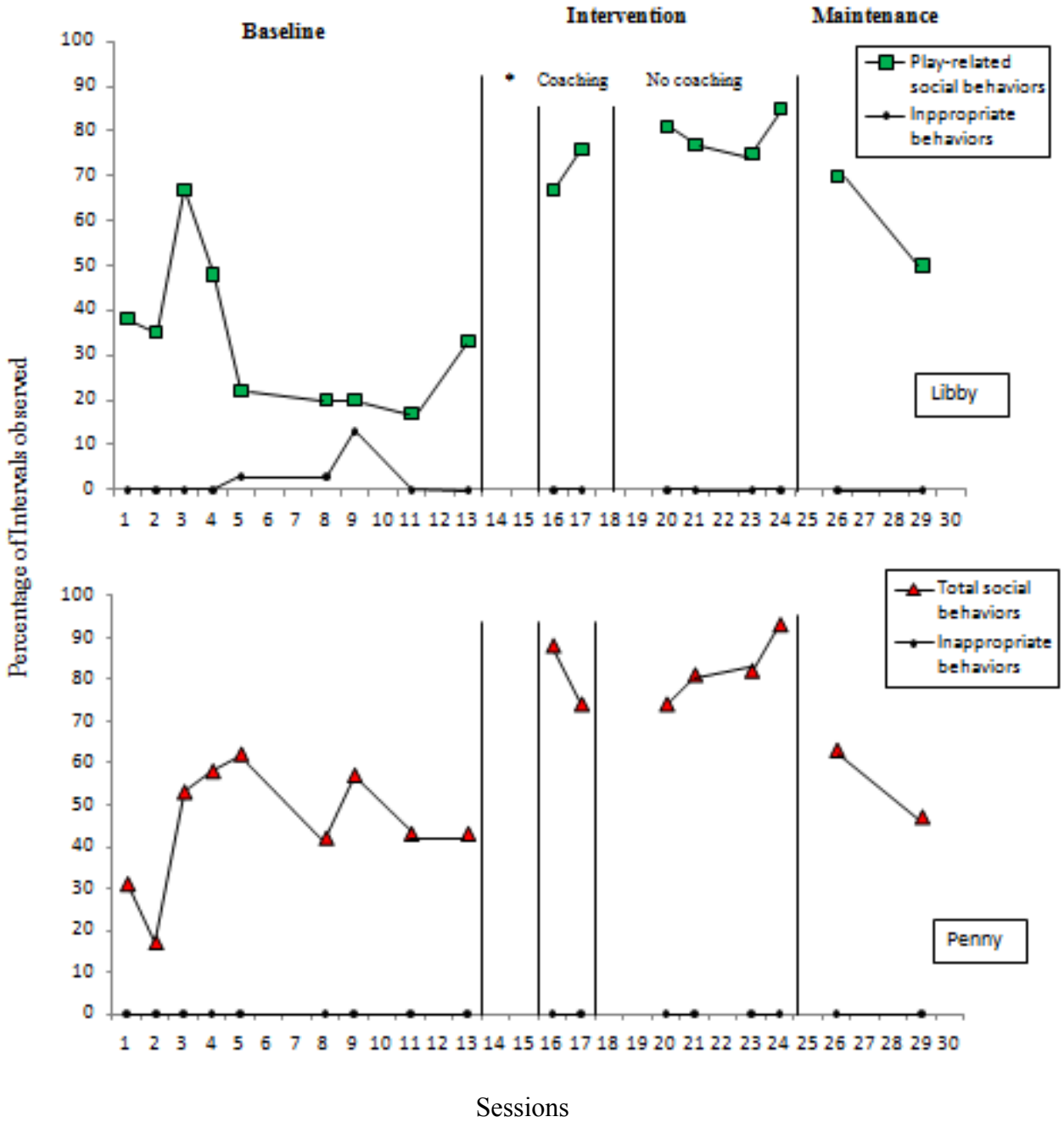
*Note: Training sessions without data collection between the baseline and the intervention

Figure 4 – Terry & Sam's Social Interaction Behaviors



*Note: Training sessions without data collection between the baseline and the intervention

Figure 5 – Libby & Penny's Social Interaction Behaviors



*Note: Training sessions without data collection between the baseline and the intervention

Appendix A: Consent Form and Questionnaires for Child information, Child Social Skills, and Sibling Information

Consent Form
Sibling-Implemented Intervention for Improving Social Interaction Skills for Young Children who have Difficulties with Socialization

The Department of Early Childhood Special Education at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish your child to participate in the present study. You may refuse to sign this form and not allow your child to participate in this study. You should be aware that even if you agree to allow your child to participate, you are free to withdraw at any time. If you do withdraw your child from this study, it will not affect your relationship with this unit, the services it may provide to you, or the University of Kansas.

PURPOSE OF THE STUDY

The purpose of this study is to assess the potential of siblings as an important intervention agent by systematically teaching them appropriate social skills and strategies in order to improve the social interaction skills of their siblings who have difficulties with socializations.

PROCEDURE

Using a single-subject, multiple baseline design across the sibling/child pairs, the study will investigate the following four research questions: (a) Does sibling-implemented intervention promote typically developing siblings' social interactions with their siblings with disabilities? (b) Does sibling-implemented intervention promote children with disabilities' social interactions with their siblings? (c) Do social interactions of both children with disabilities and their siblings maintain as assessed through video-taped observations during scheduled playtime one week, three weeks, and six weeks after the completion of sibling-implemented intervention? and (d) Do the participants assess sibling-implemented intervention to be socially valid?

The intervention training will consist of three steps: (1) "Stay"- I will teach your typically developing child how to move into the area in which your child with a disability is playing and then to stay within the area. (2) "Stay and Play"- I will teach your typically developing child how to join in play together with your child with a disability. (3) "Stay, Play, and Talk"- I will teach your typically developing child how to talk and actively play together with their sibling with a disability. In order to teach your typically developing child the skills and strategies related to these three steps, first of all, I will explain the skills and strategies related to each step using a cue card. Second, I will model the skills and strategies for your typically developing child. Third, I will practice the skills and strategies with your typically developing child. Fourth, I will ask your typically developing child to play with your child with a disability using the skills they have just learned. While your typically developing child plays with your child with a disability, you and I will provide them both with coaching including prompts and encouragement as needed. Finally, your typically developing child will play with your child with a disability without any coaching from us. This play time will be videotaped for the purpose of assessing your children's social interaction as well as your typically developing child's use of the skills.

Once you consent and your children (i.e., child with a disability, his or her older sibling) assent to participate in the study, I will ask you to complete questionnaires for your children's information. The questionnaires is provided to you for determining if your children meet the criteria established for participation in the study. The attached file provides a copy of the questionnaires. After this procedure, the researcher will contact and visit your family in order to further discuss the purpose of the study, expected roles of each of the participants (i.e., your child with a disability, your typically developing sibling, researcher, and you), and timeline for overall sibling-implemented intervention. Our meetings for the training will be once or twice a week lasting a minimum of 30 minutes. The researcher will ask you about your and your children's most convenient times and days of the week for participating in the study. The schedule will be set on a monthly basis and remain as consistent as possible with some flexibility considering unexpected schedule changes of your family (e.g., vacations, holidays, illness). It is expected that your families' participation will be approximately four months. The researcher and you will inform each other of the need to cancel or reschedule in advance using email or phone as mutually determined. For each meeting, the researcher will contact you at least one day before the scheduled meeting to confirm. In these meetings, the researcher is willing to answer any questions you have and discuss any issue or concern that you have.

ROLE OF SIBLING

Siblings will be taught the specific social skills and strategies as identified earlier. This will include role playing with the researcher as a way to practice the skills. Then, they will practice using the skills and strategies as they interact with their sibling with a disability. The researcher and children's parents may provide coaching as needed. Finally, they will play with their sibling with a disability using the skills and strategies without coaching for approximately 10 minutes. During this time, their play will be videotaped for later coding.

ROLE OF PARENTS

Parents will review the provided written notes regarding study, training and intervention procedures and each participant's role before the beginning of the intervention. During the intervention, while the researcher/sibling training is having completed, the parents will be with their child with a disability. During the sibling practice session, parents will be asked to assist the sibling together with the researcher as needed.

ROLE OF CHILDREN WITH DISABILITIES

Your child with a disability will play with their sibling for approximately 20 minutes. The final ten minutes of this play will be videotaped for later coding.

USE OF VIDEOTAPE

For the study, the researcher needs to use **videotaping for recording**. Videotaping is conducted only for the purpose of the researcher's later coding of your children's social interaction during the playtime. Therefore, only your children (child with a disability and his or her sibling) will be appeared in the videotapes. No adults including yourself will not be videotaped. The videotapes

will not be used for any other purpose (e.g., presentation at conferences). Thus, your permission for videotaping your children's play is needed. The names from this consent form will be replaced by pseudonyms to ensure confidentiality. The researcher will use codes instead of actual family names and store all of the information collected including videotapes in a secure location. At the end of the study all materials including videotapes with identifying information will be destroyed.

RISKS

Your children including your child with a disability and his or her older sibling and you will regularly use a small portion of your week to participate in the training and play sessions for this study. Thus, each of you will need to establish a time once or twice a week for participation together. Since only three members of your family participate, it is possible that the other family member(s) who do not participate in the study may feel uncomfortable and have their routine disrupted at the time of the sessions. Furthermore, it is possible that during the play session one or the other of your children may engage in negative or challenging behavior and/or negative interaction with each other. If this should happen, we will immediately halt the session and intervene to calm the child(ren) and if feasible return to the session. Following such an episode, you and I will discuss strategies to prevent future issues.

BENEFITS

It is anticipated that your family may experience several of the following benefits: (a) your typically developing child may learn new skills and strategies for increasing their positive interactions with your child with a disability during playtime, (b) your typically developing child may have a better understanding of his or her sibling with a disability's social behaviors, (c) your child with a disability may increase his or her social interactions with his or her typically developing sibling and (d) you may learn some new facilitating techniques to enhance play opportunities and social interactions between your children during playtime.

PARTICIPANT CONFIDENTIALITY

Your children or your family name will not be associated in any way with the information collected about your children or with the research findings from this study. The researcher will use a study number or a pseudonym instead of your children or your family name. The researchers will not share information about your children or your family unless required by law or unless you give written permission.

Permission granted on this date to use and disclose your information remains in effect indefinitely. By signing this form you give permission for the use and disclosure of your child's information, excluding your child's name, for purposes of this study at any time in the future.

REFUSAL TO SIGN CONSENT AND AUTHORIZATION

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, your child cannot participate in this study.

CANCELLING THIS CONSENT AND AUTHORIZATION

You may withdraw your consent to allow participation of your child in this study at any time. You also have the right to cancel your permission to use and disclose information collected about your child, in writing, at any time, by sending your written request to: Taeyoung Kim, 1501 George Williams Way #D-7, Lawrence, KS 66047, ktkty@ku.edu. If you cancel permission to use your child's information, the researchers will stop collecting additional information about your child. However, the researcher may use and disclose information that was gathered before she received your cancellation, as described above.

Any questions about procedures that you may have should be directed to the researcher(s) listed at the end of this consent form.

PARTICIPANT CERTIFICATION:

I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study. I understand that if I have any additional questions about my child's rights as a research participant, I may call (785) 864-7429, write to the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7563, or email mdenning@ku.edu.

_____I agree to have my children's play videotaped

_____

Parent/Guardian Signature

I agree to allow my child to take part in this study as a research participant. By my signature I affirm that I have received a copy of this Consent and Authorization form.

_____

Type/Print Typically Developing Child (sibling)'s Name

_____

Type/Print Child with a disability's Name

_____

Parent/Guardian Signature

_____

Date

[If signed by a personal representative, a description of such representative's authority to act for the individual must also be provided, e.g. parent/guardian.]

Researcher Contact Information

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Questionnaires

► Direction: The following questionnaires is designed to ask you about your children's information, current social skills of your child with a disability, and characteristics of your typically developing child in order to ensure if your children meet the criteria established for participation in my study.

► Please fill out the blank or check (√) that best matches with your answer. Thank you.

Child Information

▪ Child's name: _____ ▪ Gender: _____

▪ Age: _____years _____month(s)_

▪ Type of classroom that your child with a disability is currently attending:
___Special Education class including children with and without disabilities
___Public school or public funded (e.g., Head Start) school which includes children with and without disabilities
___Community preschool or childcare including children with and without disabilities
___Early Childhood Special Education classroom including only children with special needs
___Other, please explain _____

▪ Disability that best match with your child's diagnosis (Please check √ all that apply):

____Autism	____Developmental delay
____Deaf-blindness	____Deafness
____Emotional disturbance	____Hearing impairment
____Mental retardation	____Orthopedic impairment (e.g., cerebral palsy)
____Specific learning disability	____Speech or language impairment
____Traumatic brain injury	____Visual impairment including blindness

____Multiple disabilities not including deaf-blindness (e.g., mental retardation-blindness)
____Other health impairment (e.g., asthma, attention deficit disorder, epilepsy)
____Other, please specify_____

▪ Services that your child are currently receiving:

____ Physical therapy	____ Speech/Language therapy
____ Occupational therapy	____ Music therapy

____ Early childhood special education
____ Other, please specify_____

► Please circle the number that best matches with your answer about your child's current social skills. Thank you.

Child Social Skills

Social Skills	Never	Rarely	Some-times	Often	Very Often
1. My child plays with other children.	1	2	3	4	5
2. My child begins activities or play and ask friends to join in.	1	2	3	4	5
3. My child finds ways to stop conflicts.	1	2	3	4	5
4. My child begins play with toys and finishes the activity without being told. For example, your child gets out a puzzle, puts it together, and puts it away.	1	2	3	4	5
5. My child participates in a small group activity with adult supervision.	1	2	3	4	5
6. My child participates in a large group activity with adult supervision.	1	2	3	4	5
7. My child follows rules in places outside of his or her home or school. For example, my child follows rules to stay seated during a bus ride or follows directions to not touch food in the grocery store.	1	2	3	4	5
8. My child expresses what he or she likes and dislike. For example, my child says, "I like chocolate cake." or "no."	1	2	3	4	5
9. My child understands how his or her behavior affects others. For example, after pushing another child or sibling, my child says, "I am sorry."	1	2	3	4	5

► Please circle the number that best matches with your answer about your typically developing child. Thank you.

Sibling Information

▪ Sibling's name: _____ ▪ Gender: _____

▪ Age: _____ years _____ month(s)

▪ Grade: _____

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. My older child frequently plays with his or her sibling with a disability.	1	2	3	4	5
2. My older child is willing to participate in the training.	1	2	3	4	5
3. Generally, my older child has no problem with interacting or playing with peers or others.	1	2	3	4	5
4. My older child, in general, has socially more advanced than his or her sibling with a disability.	1	2	3	4	5
5. My older child's cognitive ability is at a level that would indicate he or she is able to understand and participate in the training.	1	2	3	4	5

Appendix B: Child and Sibling Data Coding Form

Children's Data Coding Form

Sibling/child name: _____ Date: _____

Observer: _____ Session: _____

1						**2**					
:00-:10	:10-:20	:20-:30	:30-:40	:40-:50	:50-1:00	1:00-1:10	1:10-1:20	1:20-1:30	1:30-1:40	1:40-1:50	1:50-2:00
3						**4**					
2:00-2:10	2:10-2:20	2:20-2:30	2:30-2:40	2:40-2:50	2:50-3:00	3:00-3:10	3:10-3:20	3:20-3:30	3:30-3:40	3:40-3:50	3:50-4:00
5						**6**					
4:00-4:10	4:10-4:20	4:20-4:30	4:30-4:40	4:40-4:50	4:50-5:00	5:00-5:10	5:10-5:20	5:20-5:30	5:30-5:40	5:40-5:50	5:50-6:00
7						**8**					
6:00-6:10	6:10-6:20	6:20-6:30	6:30-6:40	6:40-6:50	6:50-7:00	7:00-7:10	7:10-7:20	7:20-7:30	7:30-7:40	7:40-7:50	7:50-8:00
9						**10**					
8:00-8:10	8:10-8:20	8:20-8:30	8:30-8:40	8:40-8:50	8:50-9:00	9:00-9:10	9:10-9:20	9:20-9:30	9:30-9:40	9:40-9:50	9:50-10:00

- Total number/percentage of social interaction occurrences: _____/_____(_____%)
- Total number/percentage of **Play-related** social interaction occurrences: _____/_____(_____%)
- Total number/percentage of **Social Initial** occurrences: _____/_____(_____%)
- Total number/percentage of **Social Response** occurrences: _____/_____(_____%)
- Total number/percentage of **Inappropriate** behaviors occurrences: _____/_____(_____%)

Appendix C: Social Validity
Parent and Sibling Questionnaires & Questionnaires for Video Segments

Parent Questionnaire

Date:_____ Parent: _____

► Direction: Please circle the number that stands most closely for your opinion.

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. The intervention is appropriate and important for my children and/or family.	1	2	3	4	5
2. The intervention training procedures were easy for my children and me to follow.	1	2	3	4	5
3. I feel that I can teach the skills and strategies with the provided written notes regarding the intervention for my children in the future.	1	2	3	4	5
4. The intervention was helpful for my typically developing child's interaction with his or her sibling with a disability.	1	2	3	4	5
5. The intervention was helpful for my child with a disability's interaction with his or her sibling.	1	2	3	4	5
6. The intervention was helpful for my child with a disability's interaction with others (e.g., peers, other family members, teachers, neighbor children).	1	2	3	4	5
7. Overall, my children enjoyed participating in the intervention.	1	2	3	4	5
8. Overall, I enjoyed participating in the intervention.	1	2	3	4	5

► Please identify the challenges that you or children have experienced through the intervention.

_____

_____

_____

► Other comments: _____

_____

_____

_____

Sibling Questionnaire

Date:_____ Sibling: _____

► Direction: Please circle the face for you answer to each question.

Questions	 **Yes**	 **Don't know**	 **No**
Did you enjoy the training?			
Did you find the training easy to do?			
Do you believe that you will use the things you learned in the future?			
Do you find the things you learned to be helpful in playing with _____?			
Do you think that the things you learned help you in general with your brother/sister?			
Were there any things that you found difficult to do?			

Questionnaire for Video Segments

Date:_____ Name:_____ Family: 1__ 2__ 3__

► Direction: Please circle the number that stands most closely for your opinion for each the video clips.

Questions	Very low	Low	Neutral	High	Very high
1. Rate the degree to which the sibling actively initiated the joint play activity.	1	2	3	4	5
2. Rate the degree to which the sibling actively maintained the joint play activity.	1	2	3	4	5
3. Rate the degree to which the sibling appropriately scaffolds the child's play behavior to facilitate more sophisticated and appropriate the joint play activity.	1	2	3	4	5
4. Using the scale, rate the level of enjoyment of the children demonstrated during their play.	1	2	3	4	5
5. Rate the level of positive social interactions between the children.	1	2	3	4	5

Appendix D: Implementation Fidelity for the Intervention Training

Checklist for Step 1-*Stay*

Date: _____ Family: _____

---

a. Does the researcher provide a definition of "Stay" to the sibling?
Yes___ No___

b. Does the researcher ask to the sibling for the sibling's verbal rehearsal of the definition of "Stay"?
Yes___ No___

c. Does the researcher provide hints or prompts when the sibling responds incorrectly or miss some part of the answer?
Yes___ No___

d. Does the researcher provide an example that the sibling(s) can apply the meaning of "Stay" (i.e., the sibling is in the kitchen, the child is playing with puzzle in the dining room) to the example?
Yes___ No___

e. Does the researcher ask the sibling to think about what the sibling will do for gaining the child's attention?
Yes___ No___

f. Does the researcher present a 'cue card' to the sibling after the sibling responds to the above question?
Yes___ No___

g. Does the researcher provide a model of the skill for "Stay" in the cue card to the sibling?
Yes___ No___

h. Does the researcher provide chances for practice of the skill for "Stay" to the sibling?
Yes___ No___

Checklist for Step 2-*Stay and Play*

Date: _____ Family: _____

---

a. Does the researcher ask to the sibling about the skill being taught from the previous step, "Stay"?
Yes___ No___

b. Does the researcher provide hints or prompts when the sibling responds incorrectly or miss some part of the answer for the above question?
Yes___ No___

c. Does the researcher ask to the sibling to think about how she or he needs to join playing with the child?
Yes___ No___

d. Does the researcher provide a definition of "Stay and Play" to the sibling when she or he answers the above question?
Yes___ No___

e. Does the researcher present a 'cue card' to the sibling after the sibling responds to the above question?
Yes___ No___

f. Does the researcher provide a model of the skill for "Stay and Play" in the cue card to the sibling?
Yes___ No___

g. Does the researcher provide chances for practice of the skill for "Stay and Play" to the sibling?
Yes___ No___

h. Does the researcher provide tips and strategies for using the skill for "Stay and Play" in the cases that the child does not respond to the sibling?
Yes___ No___

Checklist for Step 3-*Stay, Play, and Talk*

Date: _____ Family: _____

---

a. Does the researcher ask to the sibling about the skills being taught from the previous steps, Step 1 & 2?
Yes___ No___

b. Does the researcher provide hints or prompts to the sibling when the sibling responds incorrectly or miss some part of the answer for the above question?
Yes___ No___

c. Does the researcher ask to the sibling the tips/strategies for using the skill for "Stay and Play" in the cases that the child does not respond to the sibling even though the sibling asks to join in the play?
Yes___ No___

d. Does the researcher provide hints or prompts to the sibling when the sibling responds incorrectly or miss some part of the answer for the above question?
Yes___ No___

e. Does the researcher ask to the sibling to think about how she or he would do to continue playing with the child (i.e., Step 3)?
Yes___ No___

f. While asking the above question, does the researcher provide a specific play example to the sibling for helping her or his answer?
Yes___ No___

g. Does the researcher provide a 'cue card' and tips to the sibling for his or her learning social skills and strategies for "Stay, Play, and Talk"?
Yes___ No___

h. Does the researcher provide a model of the skill and strategies for "Stay, Play, and Talk" in the cue card to the sibling?
Yes___ No___

i. Does the researcher provide chances for practice of the skill and strategies for "Stay, Play, and Talk" to the sibling?
Yes___ No___

CHAPTER 4

Social Interaction Skills and Strategies for Supporting Families to Apply Sibling-Implemented Social Interaction Intervention: Research to Practice

Abstract

The purpose of this chapter is to utilize the knowledge gained from the literature review and research study to bridge the gap between research and practice. This chapter provides practical information and tips for families of young children with disabilities and early childhood teachers to teach specific skills and strategies to the siblings and typically developing children in classes for enhancing young children with disabilities' social interaction skills.

Chapter 4

Social Interaction Skills and Strategies for Supporting Families to Apply Sibling-Implemented Social Interaction Intervention: Research to Practice

During free-play time, four-year-old Justin roams around his classroom and looks around as his classmates play. He seems not to be able to decide what he wants to play. After a few minutes, he finds a group of children who are laughing and talking together as they build a huge castle and a train track with building blocks. He moves close and sits besides them. No one notices him even though he sits where they are working and playing. In a few seconds, he reaches out to touch the castle. One of the children in the group, Juan, quickly shouts to his friend, "He is trying to touch your castle, Kobe!" Then, Kobe looks back to Justin and says, "No, don't touch it." Justin steps back a little bit and then picks up a block and puts the block on the castle. Kobe, says, "No, this is mine. You make your own." However, Justin again picks up a block and puts another block on the castle. Kobe takes the block away saying, "No, don't do that. I don't need them." Then, Justin suddenly knocks the castle so that it crumbles all in a heap. Kobe's eyes get big as he screams, "No—O—O!"

Justin who has autism has an older brother, Mike, who is in the 1st grade. Justin usually plays alone with cars, which are his favorite toys. He does not show interest in the things that Mike plays with or does. He does not make eye contact with his brother nor does he really pay him any attention. Although Mike has many opportunities to spend time with Justin, he actually spends very little time playing with Justin because he gets so little response back from him so Mike has just quit trying. Moreover, Mike hates it when his brother suddenly screams or throws things with seemingly no reason. So, Mike prefers to play alone or with his own friends. Mike has several good friends with whom he plays frequently but Justin has none. Mike does not hate

his younger brother but he feels he does not know how to play with Justin. Justin just seems to be different.

Social integration and formation of peer relationships are considered to be major issues for ensuring successful inclusion of young children with disabilities into typical educational settings (Guralnick, 1990; Odom, 2002; Odom, McConnell, & Chandler, 1993; Odom, McConnell, & McEvoy, 1992; Strain, 1990). Therefore, achieving age appropriate peer interaction skills and the ability to develop positive peer relationships for young children with disabilities is a major focus for their families and practitioners. Acquisition of age-appropriate social interaction skills is, in fact, a critical factor for ensuring young children with disabilities' successful participation and sense of belonging in school setting.

Young children's positive peer interactions and relationships also play a foundational role for building peer friendships in the future (Odom, McConnell, & Brown, 2008; Odom, McConnell, & McEvoy, 1992; Vaughn, Colvin, Azria, Caya, & Krzysik, 2001). However, children with disabilities frequently have difficulties with participating in reciprocal peer interactions due to their limited or lack of specific social skills. Thus, they frequently have very limited peer-related social experiences although they may be exposed to peers in preschool settings. Although Justin, described in the opening vignette, attends an inclusive preschool setting, he infrequently initiates or maintains appropriate social interactions with other children. He wants to join in the play of other children but his peers are hesitant to play with him because he frequently interrupts and sometimes destroys their play by taking a toy or material from them, spoiling their work, or not following the game or activity rule. Thus, peers, such as Juan and Kobe, may need to learn some specific social interaction skills to facilitate positive peer interactions with their peers with disabilities.

In addition, to opportunities for peer interaction, Justin, like many typically developing children, has the opportunity to spend large amounts of time with his sibling playing together in his daily routines (Azmitia & Hesser, 1993; Downey & Condron, 2004; Stoneman, 2005). Older siblings are frequently expected by their parents to serve as peers as well as facilitators during the playtime. However, if the sibling experiences no or negative responses from their siblings with disabilities, they may feel frustrated and thus hesitate to engage in play or social interactions with their siblings with disabilities. Like Justin and Mike's story, both the child with a disability and his or her sibling may experience limited positive daily learning opportunities even though they spend significant amounts of time together in their family contexts (Knott, Lewis, & Williams, 2007; Stoneman, 2005). Thus, siblings, such as Mike, may need to learn some specific social interaction skills to facilitate positive interactions with their siblings with disabilities. If siblings learn specific skills to support their siblings' social initiations and interaction, they can potentially play an important role in improving the social interaction skills of their preschool sibling with disabilities. Thus, sibling-implemented social interaction intervention has the potential to provide young children with disabilities with additional positive opportunities for learning and practicing peer social interactions. Young children with disabilities' social interaction skills can be enhanced through these learning and practice opportunities with their siblings who have more advanced social skills which many in turn support their use of the skills with peers at school.

A large body of research, in fact, has demonstrated that peer-implemented interventions are an evidence-based practice in that peers are powerful intervention agents for enhancing social skills of children with disabilities, particularly, children with autism (McConnell, 2002; Odom, Brown, Frey, Karasu, Smith-Canter, & Strain, 2003). In these studies, the peers were taught

specific social skills and strategies to support their initiation and response to children with disabilities and for sustaining interactions once begun. Currently only a few studies (i.e., James & Egel, 1986; Tsao & Odom, 2006) are available in which siblings have been demonstrated to be effective intervention agents for improving their siblings with disabilities' social interaction skills. However, given the strong evidence of effectiveness of peer-implemented interventions, it would appear that siblings could also be successful intervention agents if they are systematically taught appropriate social skills and strategies.

The purpose of this paper is to provide information on effective peer intervention strategies that families of children with disabilities can implement to facilitate their children's meaningful social interactions during in home playtimes. Specifically, this paper will describe a process for families and practitioners to work together to implement systematic training for siblings on how to become successful social skills intervention agents. The sibling training presented is a modification of a peer-mediated intervention, "Stay-Play-Talk," developed by English and colleagues (English, Shafer, Goldstein, & Kaczmarek, 1997). In adapting the "Stay-Play-Talk" program, elements of the Social Skills Curriculum developed by Strain and colleagues (Strain, Danko, & Lawry, 1998) were incorporated into the sibling training as well. In the remainder of the paper, the sibling training intervention will be presented beginning with preparation and planning tips followed by a description of how to implement the training.

Preparation and Planning Tips

To support successful implementation of the sibling training, families and their professional partners should engage in some preplanning and consider the following: (a) preparing the setting and selecting appropriate materials, (b) scheduling training and play times, and (c) understanding the role of each family member and other adults.

Setting and Materials

Preparing the setting and gathering the needed materials is an important first step in setting the stage for ensuring children's social interaction during their playtime. In preparing the setting or play area, we need to address multiple aspects including: a) Is it a comfortable setting with appropriate lighting and noise levels?; b) Is the size of the space appropriate?; c) Are opportunities for disruption/distraction reduced?; and d) Are the materials provided supportive of social interactions? Play areas need to be comfortable as well as quiet enough that children can pay attention to their play. The space allotted for play needs to be of an appropriate size to allow the children to move freely yet not so large that the children can easily play completely separate from one another. Play areas should also be chosen such that the chance for intrusion by others and other distractions (e.g., lots of toys, accessible foods/snacks) is reduced.

Selection of toys and materials should be carefully considered once families have chosen the appropriate play area. Some toys or materials such as dramatic play materials, toy barn with animals or toy vehicles with a race track facilitate more children's social interaction than other more solitary toys or materials such as books, puzzles, and art materials. Additionally, all children have preferences for specific toys and materials and use of these preferred materials will support their sustained interests and attention. Thus, families and professionals should as they select toys or materials consider the children's preferences and how the toys might create opportunities for social interaction between children. For example, in our opening vignette, we know that both Justin and his brother, Mike, like to build with blocks. Thus, we select this as the play material but include only a few items like trucks, cars, and little people, which they will need to share and thereby support social interaction.

Scheduling Dates and Time

As plans are made for beginning intervention, the family should carefully think through the scheduling issues of their children both the child with disabilities and the typically developing sibling. The frequency and length of the sibling implemented training should be appropriately matched to the children's time availability, chronological ages, needs, and level of understanding. For example, sibling training for a four-year old child who has a relatively short attention span would need to be different from that for a nine-year old child. For the four-year old child, the parent would need to schedule short session in the beginning and then gradually increase the length of the session as the child becomes more comfortable and confident. This will also serve to prepare the sibling for training for later learning of more complicated skills and strategies that requires longer attention spans. Furthermore, the parent would incorporate more frequent breaks for a younger sibling when the sibling is learning more complicated and difficult skills and strategies. However, breaks should not be so long as to potentially result in the sibling finding it difficult to return to the training.

Some children may need more praise and encouragement in order to maintain their attention. In this case, the parent needs to carefully plan for how they will provide frequent praise and encouraging comments. Thus as they plan the intervention, the parents need to carefully consider their children's learning characteristics and styles. Parents must also carefully observe both of their children and be prepared to alter the training and play setting based upon behaviors observed. For example, if either child is having a bad day due to illness or possibly having experienced a conflict with their sibling or a friend, the session may need to be shorten or skipped altogether. Certainly changes to the planned schedule may also need to occur due to

schedule conflicts (e.g., doctor's appointments, birthday party, unexpected family event). However, maintaining as consistent a schedule as possible is strongly recommended.

The frequency and length of the sibling training may also need to be modified depending on the amount and difficulty of skills or strategies that the siblings have to learn. For example, some skills and strategies are more complicated and difficult for the sibling to master than other skills and strategies. In order to teach relatively complicated and difficult skills and strategies, the parent will need to spend more time with the sibling by providing several different examples, modeling specific examples, and repeatedly practicing the skills and strategies so that the sibling can feel confident in their ability to use the skills and strategies.

Understanding Roles

Before a family starts to work with their children, all participants should clearly understand their respective roles. For the parents' role, both parents need to carefully read through the description of the intervention components and sequences, the specific social interaction skills and strategies, the tips for parent assistance, and each family member's role. Then, they need to explain the intervention briefly to the sibling. During the sibling training component, one parent teaches the specific social skills and strategies to their older child (i.e., sibling without disabilities) and practices the skills with the sibling through role plays. While one parent works with the sibling, the other parent or other adult may need to supervise their child with a disability. Following the sibling training session, the parent will ask their children to play together and specifically asking the sibling to use the learned skills and strategies. The parents provide assistance in the form or prompts and reminders as needed. For example, if the sibling does not appropriately use the skills and strategies during the play session, the parent would provide a cue card or verbal prompt. Or if the child with a disability displays a negative behavior,

the parent would step in and help to resolve the issue and then assist with resuming the play session as appropriate.

The sibling's specific role is as the intervener with the child with disabilities by using the specific social skills and strategies they have been taught by their parent. Thus, after participating in the training with their parent, they practice the learned skills and strategies through role plays with their parent. Finally, the sibling plays with their sibling with a disability using the skills and strategies first receiving assistance from their parent(s) as needed but with the ultimate goal being that they do so without assistance from their parent(s). For the children with disabilities, the expected role is that they play with their sibling with their sibling's support and help.

Finally, if a professional such as the child early childhood special education teacher is working together with the family to implementation the sibling training, the professional may need to work together and teach the parents how to implement the training including providing support and coaching. The professional should discuss together with the parents the general nature of the training and strategies for planning for and implementing effective training. For example, at initial meeting of the parents and professional they brainstorm ideas and fully discuss the key elements for successful training with the parents including the frequency and length of each training session, teaching strategies that are matched to their children's learning and play characteristics, and coaching strategies. During the implementation of training by the parent, the professional can serve in the role of supporting the parent and providing them with feedback as they conduct the training sessions with the sibling and as the parent coaches the sibling in the practice session with the child. At the end of the session the professional and parent can meet as needed and discuss ideas and thoughts for solutions difficult situations that might arise. For example, if the child consistently refuses to play with the sibling even after the

sibling's several asks to join in play, the parent and professional could meet together and generate the solution of having the parent in the next session play together with the sibling using the child's preferred toys. The parent and professional would by hypothesizing that this solution might serve as an attention getting and motivating strategy to bring the child into the play context. The professional's role is important as a supporter as well as a coworker with the parent as they provide specific tips and feedback to the parent and generally work together collaboratively with the family.

Sibling Training Implementation

Once the preparation activities have been completed, the family is ready to begin implementation of the intervention. The sibling training is comprised of the following three steps: Step one-*Stay,* Step two-*Stay and Play,* and Step three-*Stay, Play, and Talk (adapted from English et al., 1997)*. For Step one-*Stay*, the sibling is taught how to move into physical proximity of the child with a disability, stay in proximity, and get the child's attention. For Step two-*Stay and Play,* the sibling is taught to get the attention of the child and join in play with the child. Finally, for Step three-*Stay, Play, and Talk*, the sibling is taught how to begin a conversation with the child while continuing to play with the child. Prior to implementing Step 1-Stay, the parent needs to decide if this step is needed. That is, if the sibling already routinely initiates play with their sibling with a disability, the parent should move directly to teaching the skills and strategies for Step 2- *Stay and Play*. The following sections provide detailed descriptions of each step including strategies for the withdrawal of assistance by the parent.

Step 1- *Stay*

As previously noted, one parent primarily works with the sibling while the other parent or other adult as appropriate stays with the child with a disability. The sequences for step 1 include:

(1) parent provides a definition of the skill to the sibling, (2) sibling completes verbal rehearsal of the definition, (3) sibling applies the skill to an example provided by the parent, (4) parent provides instruction on the use of a "cue card," (5) parent models the skill for the sibling, and (6) parent and sibling role play the use of the skill. Table 1 provides an example script for Step 1-*Stay*. Given that Step 1 is relatively simple and straightforward, it is not necessary for the parent to require the sibling to demonstrate acquisition of the skills by playing with their sibling with a disability. Instead, the parent moves directly to Step 2, *Stay and Play*, and will have the sibling practice the Step 1 and 2 skills and strategies after completing the teaching of the skills for Step 2.

Step 2-*Stay and Play*

After completing the training process for Step 1-*Stay*, the parent begins the training on Step 2-*Stay and Play* with their children. The activities for Step 2 are similar to those of the previous step. First, the parent engages in a brief review by asking the sibling if he or she remembers the skills learned and they briefly talk through them. Then the parent moves to building on these previously learned skills for Step 2. Specifically, the parent asks the sibling, "Now, let's think about what you would do to play with (child's name). After you stay with (child's name) and get his/her attention, what would you do to join in play with (name)?" The sibling might respond to the parent, "I'd ask (child's name), 'Can I play with you?' "The parent provides appropriate praise for the sibling's response. For example, "That's a good example of how we might join someone's play. When you want to join in the play, you need to ask if you can play." The parent than shares a cue card which provides several examples for joining in the play (e.g., asking "Can I play with you?", bringing a toy over or putting a toy in their hand, sharing the same toy, asking "Do you need some help?" or "I can help you."). The parent asks the sibling to join them in reading or looking over the possible approaches presented on the cue

card. The parent also provides additional instruction as appropriate for the sibling's skill and knowledge level on the use of social strategies such as sharing and requesting to share that may help the sibling's use of the skills. Specific descriptions of some of these relevant social strategies (i.e., sharing and requesting to share) are provided in Table 2. The parent should model each selected strategy and then practice through role playing with the sibling.

Once the parent and sibling have completed the training on Step 2, the parent asks the sibling to practice what they have learned with the child with a disability. That is, the parent asks the sibling to play with his or her sibling with a disability using the skills and strategies learned in Step 1 and 2. The parent provides verbal prompts if the sibling does not initiate or does so inappropriately. The parent may also provide "cue cards" if the sibling continues to have difficulties with using the skills and strategies. The parent needs to stop the session if their child with a disability engages in a challenging behavior that would not be appropriate for the sibling to address.

Step 3- *Stay, Play, and Talk*

The sequence of activities for Step 3- *Stay, Play, and Talk* are the same as for Step 2- *Stay and Play*. In this step, the parent needs to provide specific explanations and models on the use of social strategies that will help their children's extended play. The recommended social strategies included in this stage of training are offering help, suggesting play skills, organizing the play, and giving compliments. Specific descriptions of these social strategies are provided in Table 2. Once competing teaching component, the parent again directs the sibling to practice the strategies with the child as the parent provides assistance as needed just as in the previous step.

Withdraw Assistance

Once the sibling successfully uses the skills and strategies and rarely needs prompts or cues from the parent, it is time to begin the withdrawal of assistance. The parent needs to make a decision about withdrawing their supports in a timely manner so that the sibling can ultimately independently use the combined skills and strategies for all three steps in interacting with the child. For example, the parent provides supports such as showing a cue card or providing verbal prompts to the sibling if the sibling does not appropriately use the skills and strategies they learned within five seconds. However, as the sibling begins to use the skills and strategies more confidently and thus displays some improved use of the skills and strategies, the parent needs to decrease the frequency of showing the cue card, providing verbal prompts, and other corrective strategies.

Once the sibling is more consistently using the skills without the need for corrective prompts, the parent needs to step back from the children's play and allow the sibling to practice the use of the skills and primarily provide positive feedback for the child's correct implementation of the behaviors. Then, as the sibling proficiently uses the skills and strategies in interacting with the child (i.e., during the play session the sibling appropriately and consistently uses several of the skills to engage their sibling), the parent should fully withdraw their support including immediate positive feedback. However, although parent support is withdrawn, the parent needs to stay with their children and observe their play such that they can intervene with prompts if needed. Furthermore, parents always need to be available to intervene in case a serious issue arises with either of their children.

Conclusion

Sibling-implemented intervention for improving social interaction skills of young children with disabilities can be beneficial for both children with disabilities and their typically developing siblings. By learning specific social skills and strategies from their parents, typically developing children (i.e., siblings) may be able to have more meaningful social interaction with their siblings with disabilities. This, in turn, may lead to more enjoyable playtime and the sibling with a disabilities' learning new positive social interaction skills. For successful implementation of sibling training, the children's parents should complete several preplanning steps including preparing the play setting, selecting appropriate materials or toys that facilitate their children's interactions, scheduling training and practice sessions, and assessing their children's learning characteristics and needs. When the parents are well-prepared and systematically implement the training strategies, children with disabilities and their siblings, just like Justin and Mike, may be able to improve their social interactions and thus experience more meaningful play and learning opportunities. Furthermore, given that our ultimate goal for children with disabilities is developing age-appropriate social interaction skills and thus increasing the opportunities for positive interactions with their peers in community and educational settings, it would be very useful for the family to share the training and outcomes of the intervention with teachers and other professionals who work with their child with a disability. Teachers may also want to implement a modification of this training by teaching the skills and strategies to some of the typically developing children in the child's classroom who would be appropriate play partners for the children with disabilities.

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Table 1
Training Script for Step 1-Stay

	Script
Parent:	"When you want to play with your friends, you need to be with them, which we will call it 'stay'." "Stay means that you move to the child…" "Now, can you tell me what would you do for stay?"
Sibling:	"Move to where (name) is playing."
Parent:	"That's right. Now, let's suppose that you see (child's name) playing with a car in the living room and you are in the kitchen, what do you think you should do?"
Sibling:	"I move to the living room where (name) is playing with the puzzle."
Parent:	"Great, when you move to (name), what would you do next?" (if the sibling does not respond, wait 3 sec. and provides a hint)
Sibling:	"Look at …"
Parent:	"Right. Now, let's think about what you would do after you stay with (name). Although you stay with (name), he/she may not look at you. So, you may need to get the child's attention. In this case, what kind of things do you think would be good to say to (name) for getting his/her attention?"
Sibling:	"Hi" "Call (child's) name."
Parent:	"That's right. You did a great job. Here, let's look at a cue card I have that can help you remember these steps."
	"Hi" Touching/ Smiling Naming "What are you doing?"/ "You are doing puzzle." "That looks like fun."/ "I like it."
Sibling:	"Let's practice with this card." Provide a model for each strategy. Read and observe the model provided by the parent. Then, practice with the parent. (parent plays the child's role)

*Note: a. If the sibling does not respond, the parent will wait 5 sec. and then re-ask a question with prompts.
b. If the sibling continues not to respond to the parent's question, the parent will provide the answer and then re-ask the question.
c. If the sibling has some difficulties with practice, the parent will provide a model.

Table 2
Social Strategies

Strategies	Description	Examples	Tips for use
Sharing	Giving a toy or material to the other child	"Here, ..." giving a toy over or put a toy in ... hand	If the target child drops or throws the toy, or even walks away, it does not mean that the child does not want to play. Try again! - Drops or throws: Pick it up and ask in another way, "Here, (name) You have a red car. You like it?" "Do you want another? How about a blue car?" - Walks away: Touching shoulder or arm, saying "Hey, here it is. Let's play with me." Etc.
Requesting to share	Asking for a toy	"Can you give me a car?" "Can I get the red car?" Holding out your hand, "... give me a car, please"	If the target child does not respond or does not want to give what siblings asked, ask him/her again! Show him/her you need something by holding your hand out and say "thank you" when he shares. - Wait a few seconds and ask again, "(name) Can I have the red car, please?" - Touching and ask him again.
Offering help	Asking if the child needs help or offer physical or verbal help	"Do you want me to help you?" "Can I help you?" Holding the target child's hand over the toy, "I can help you. Here..."	If the target child does not respond, wait a few seconds and say that again. If the target child tries to walk away, touch his shoulder or arm and say that again.
Play organizing	Provide ideas that can have extended play	"Let's play with a parking garage." "I will be a taxi driver and you will be a ..." "You can make a castle with the blocks"	When the target child does not feel interested in the play, suggest ideas that help extend the play. If the child does not respond or tries to leave, bring a new toy that is related to the play and ask him/her again. Or show him/her how to play in new settings or with new materials.
Compliment	Provide praises and encouragements	Say nice things, "Good job" "That is great!" "How nice" "I like it" Give them a high five. Pat them on the shoulder with smiling.	Provides these praises and/or encouragements as much as you can.